

**PREDICTORS OF PUNJABI, HINDI AND ENGLISH READING
COMPREHENSION AMONG MULTILINGUAL CHILDREN IN THE
PUNJAB REGION OF INDIA**

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Gratitude to teachers and parents for guiding and inspiring me:

गुरुर्ब्रह्मा गुरुर्विष्णुः गुरुर्देवो महेश्वरः ।

गुरुः साक्षात् परं ब्रह्मा तस्मै श्री गुरवे नमः ॥

Gurur Brahma Gurur Vishnu Gurur Devo Mahenshwaraha

Guru Sakshat Param Brahma Tasmai shri Gurve Namaha

Meaning: Guru(Teacher) is verily the representative of Brahma (creator), Vishnu (protector) and Shiva (destroyer). He creates, sustains knowledge and destroys the weed of ignorance. I salute such Guru (Teacher).

The material presented in this thesis is the original work of the candidate, does not incorporate, without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief does not contain any material published or written by another person except where due reference is made in the text.

The research reported in this thesis has been approved by University of Canterbury Educational Research Human Ethics Committee.

~Seema Gautam

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“Do not afraid of growing slowly, be afraid of standing still”

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~Seema Gautam

Abstract

The research reported in this thesis investigated cognitive-linguistic predictors of reading comprehension (both within and across languages) among multilingual primary school children in the Punjab region of India. The participants of this study learn three languages: Punjabi, Hindi and English; and are exposed to all three from the initial stage of literacy acquisition. Unlike English, the Punjabi and Hindi orthographies are written nonlinearly with a horizontal bar on the top of the aksharas that connects aksharas within a word, and include vowel symbols that have independent and dependent forms. Both Punjabi and Hindi are alphasyllabic orthographies, whereas English is an alphabetic orthography.

Over 400 trilingual school children in Punjab (India) from grades 2 to 5 completed a measure of text reading comprehension that comprised passages followed by questions about details in those passages. Reading comprehension levels were compared to the measures of listening comprehension, phonological processing, orthographic knowledge and speed of processing. Analyses indicated the Punjabi, Hindi and English reading comprehension levels were predicted by measure of listening comprehension and word decoding, with the latter being predicted by phonological and orthographic skills. Such findings were consistent with current models of reading derived from studies of English. However, in contrast to these models, measures of orthographic skills were also predictive of variance in reading comprehension independent of word decoding across Punjabi, Hindi and English models. Contributions of phonological processing and speed of processing were also observed in the English reading comprehension model, again independent of word decoding processes. Overall, Punjabi and Hindi reading comprehension was predicted by similar predictors, with English reading comprehension showing more variations in predictors.

Further analyses investigated the influence of Punjabi and Hindi cognitive-linguistic skills on English reading levels. The findings indicated that, in the younger cohorts of students who are more likely to have less reading experience, the influence of Punjabi and Hindi measures on English was limited to word recognition. However, once these multilingual children acquire more expertise in decoding skills (i.e., in the older cohort), listening comprehension, orthographic knowledge and phonological processing in Punjabi and Hindi influenced levels in English reading comprehension.

The overall findings from this thesis were used to derive three multilingual models of Punjabi, Hindi and English and one cross-linguistic model of English reading comprehension. These models suggest that a simple view of reading could be applied to Punjabi and Hindi orthographies in a similar way to English. However, additional influences of orthographic knowledge for all three languages (Punjabi, Hindi and English) in such multi-literate learners will need to be taken into account. Additionally, the influence of first and second language skills will need to be considered when developing models of third language reading comprehension. The proposed four models that includes the additional factors are discussed in light of previous research and theories/models in the field.

Presentations/Publications arising from this thesis

Gautam, S., Everatt, J., Sadeghi, A., & McNeill, B., (2014). *The influence of underlying cognitive-linguistic abilities in reading comprehension in multilingual readers*. 7th Educational Psychology Forum, 18-19 November. University of Otago, Dunedin, New Zealand. (Conference Contribution - Oral Presentation)

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Chapter 1

General Introduction and Overview of the Thesis

1.1 Introduction

Reading acquisition in more than one language has become prevalent in many parts of the world. This is due to the use of two or more languages in certain regions of the world and/or the increase of societal bilingualism/multilingualism as a by-product of migration of people around the world, especially to western/English speaking, or more developed, countries. As part of such processes, the English language has also become popular worldwide, particularly in education and trade. Therefore, the English language has been considered as a worldwide second/foreign language (Meganathan, 2011).

Simultaneous acquisition of reading, and the ability to comprehend the written text in various languages in multilingual contexts, such as India, is very common in schools. The commonality of multiliteracy requires research to increase our understanding of the multifaceted nature of the process required for multiliteracy acquisition. This calls for an analysis of reading acquisition in all languages that children are required to learn in a specific context. While the reading research literature has addressed biliteracy over the past few decades (Archibald et al., 2006; Leikin, Schwartz, & Share, 2010; Schwartz, Share, Leikin, & Kozminsky, 2008; Zhang & Koda, 2014), investigations into multiliteracy is relatively scant. The current thesis is an attempt to inform the field by identifying potential predictors of reading within the multilingual context of the Punjab region in India.

The constitution of India recognises 22 major languages in the VIII schedule out of the many languages spoken in this multilingual country (see Chapter 3 for more details) (Koul, 2005). The ‘Three language formula’ was approved in the conference of chief ministers held in

1961 and the concrete recommendations for implementation of this formula in education was given by the Education Commission between 1964 and 1966 (Meganathan, 2011). According to this policy, every state has the right to use its regional language as the official language and as the language of educational instruction along with Hindi and English which should be taught as the national and the additional/foreign language, respectively. In Punjab, the context for the current research programme, the Punjabi language, as the regional language, is taught as the medium for education in government primary schools, but children also have to learn the Hindi and English languages.

In Punjab, children are prepared for literacy acquisition in kindergarten and learn a few basic aksharas through the phonics teaching method (i.e., by teaching grapheme-phoneme correspondence rules explicitly). The pace of acquiring literacy skills is closely related to the opportunities made available for the learning to read.

There are three types of schools under the Punjab School Education Board (PSEB) in Punjab: Government aided, Semi-Government aided and Private schools. Government Schools are run and fully owned by the Punjab Government, controlled by the PSEB, and are free for six to 14- year-old children. These schools are Punjabi medium schools (Punjabi is the main language for teaching all subjects) and introduce the Punjabi and English languages at Grade 1 and Hindi at Grade 3.

Government-aided schools receive grant-in-aid from the Punjab government but charge a nominal fee, too. These schools also follow the curriculum and policies of PSEB but are managed by the local management committees. These schools are either Hindi Medium Schools where Punjabi, Hindi and English are introduced at Grade 1, or Punjabi Medium Schools where Punjabi and English are introduced at Grade 1 and Hindi at Grade 3. Both

Government and Government aided schools typically attract children from relatively low socio-economic status.

Private Schools are affiliated with the PSEB; that is, they follow norms and curriculum framed by the PSEB. These schools charge fees, and are totally organised by the local management without any financial aid from the government. These schools utilise either Hindi or Punjabi as the medium of education, with all the three languages (Punjabi, Hindi and English) being introduced at Grade 1.

Given that children in all these three school types in Punjab are required to learn literacy skills in Punjabi, Hindi and English, it is interesting to compare the written forms (orthographies) of the three languages. Unlike the English orthography which usually utilises separate letters, Punjabi and Hindi utilise a horizontal bar to link the aksharas of a word which may aid in perceptual discrimination of word boundaries. Unlike Punjabi and Hindi, upper and lower-case distinctions are used in the English orthography (Daniels & Bright, 1996; Vaid & Gupta, 2002). Rules of consonant clusters and double sounding of the consonant (also known as gemination) also differ across Punjabi, Hindi and English. (The three scripts are discussed further in Chapter 3). Such similarities and differences are of interest since they may influence the way in which children learn reading in multilingual contexts.

Reading comprehension is a complex process which requires the acquisition of numerous skills (Koda, 2007). To understand the process of reading comprehension, many theoretical models have been proposed; these include more expanded models as the construction-integration model (Kintsch, 1998) to the simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Chapman, 2012). Among these models the simple view

of reading (SVR) is a prevalent model that has attracted the attention of researchers due to its implementation not only among monolingual children (on different orthographies) but also among bilingual/multilingual children (within languages and across language).

The SVR holds the argument that reading comprehension is the product of two components classified as linguistic comprehension (i.e., the ability to comprehend the discourse presented verbally) and decoding (i.e., the efficient word recognition). The SVR states that these two components are essential for successful reading comprehension. While, listening comprehension has been suggested to be more important in the higher grades when readers are proficient in decoding (Carver, 1998), decoding has been suggested to play an important role among less skilled readers (usually at the beginning years of learning to read). Therefore, decoding has warranted a lot of attention to highlight the processes involved in the primary school age reader's cognition. The importance of word recognition has led to the development of a number of models to help researchers, educators and clinicians understand the process of word reading (e.g., the dual-route model (Coltheart, 1985, 2006) and the triangle model (Plaut, McClelland, Seidenberg, & Patterson, 1996). In the present research, the processes of decoding of multilingual primary school children were assessed on the basis of these two models (see Chapter 2 for details on these models as the theoretical framework for the present research).

Despite research indicating that reading processes depends upon the language of the readers and the writing system that encodes the language (Perfetti & Harris, 2013), both theory and practice in the domain of reading acquisition have been evolved from the models developed from monolingual readers of the English orthography (Share, 2008). On one hand, it is good to begin with such models as a theoretical base to examine these models and investigate the underlying cognitive skills in other orthographies. On the other hand, the underlying skills

that predict reading skills seem to be different across a number orthography such as Persian, Arabic, Hebrew, etc., which may validate the English models and also highlight the needs of considering additional predictors in other orthographies. For example, the simple model of Persian reading comprehension (Sadeghi, Everatt, & McNeill, 2016) supports the two essential components of the simple view of reading (i.e., listening comprehension and decoding) and also adds the importance of orthographic knowledge to Persian reading comprehension (as an independent predictor of reading comprehension). Hence, there is still a need to investigate predictors of reading comprehension in other orthographies rather than relying on English models. The context for the current research provides a unique study on multilingual children learning to read in Punjabi and Hindi (as somewhat similar orthographies) and English which could provide more insights into reading models theoretically. Frost (2012) also emphasised that the focus on assessing different orthographies before confirming the current models/theories universally. Hence, the current research should also help educators teach reading acquisition in multilingual context such as India in a more efficient way.

1.2 The current research

The current research endeavours to examine the relevant cognitive-linguistic skills as potential predictors of Punjabi, Hindi and English reading comprehension levels and aimed at the following general themes:

1. To investigate the potential predictors of Punjabi, Hindi and English reading comprehension in order to develop Punjabi, Hindi and English multilingual models of reading comprehension among primary school children of the Punjab region of India.
2. To investigate the cross-linguistic influences of Punjabi and Hindi reading skills on English reading comprehension in order to develop the multilingual cross-linguistic

model of English reading comprehension, and also to verify the developed multilingual model of English reading comprehension.

3. To assess the practicality of theories/models of reading mostly derived from English (such as the SVR) for explaining language acquisition in other orthographies and to develop a universal model of reading despite differences between orthographies.

Two studies were designed to investigate the potential predictors of reading comprehension among multilingual primary school age children in Punjab region, India. Punjab region was considered since children are multilingual and school programmes provide language and literacy education in three languages (Punjabi, Hindi and English). The following sections provides a brief description on the research design and the findings of these two studies to provide an overview for the current thesis.

1.2.1 Study 1: Predictors of reading comprehension of Punjabi, Hindi and English among multilingual readers

This study (see Chapter 5) examines the underlying cognitive skills of Punjabi, Hindi and English reading comprehension in order to develop a reading comprehension model for each individual language under investigation. It also aimed to examine the rationality of the simple view of reading (SVR) (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Chapman, 2012) and/or component model of reading (CMR) (Joshi & Aaron, 2000) in explaining the acquisition by multilingual children in Punjab.

The Punjabi and Hindi languages utilise very similar scripts, as these orthographies are scarcely studied. Hence, the identification of predictors of reading comprehension in Punjabi and Hindi along with English obtained from multilingual speakers should provide comparative data to testify the current models of reading comprehension, such as the SVR

and CMR, and verify if these models derived from the English language can be applied to other orthographies. In other words, the current thesis is an attempt to investigate whether predictors of reading comprehension are similar or different across orthographies, and if different, in what way the reading process differs across orthographies.

Study 1 assessed predictors of reading comprehension in Punjabi, Hindi and English through a cross sectional design amongst Punjabi speaking primary school children (Grades 2 to 5) (N= 397) attending main stream schools in Punjab region, India. The concern here was not a group comparison but to investigate the relative contribution of several skills to predict text comprehension in a unique group of trilingual learners who acquired Punjabi as their mother tongue with Hindi and English as additional languages.

An assessment battery of 30 measures (10 in each language) was developed or modified in Punjabi and Hindi and English. The assessment battery was piloted to verify its suitability for the study (see chapter 4 for a review). The assessment battery was to examine listening comprehension, word decoding and reading comprehension. It also was to assess the skill levels of the participants on phonological processing, orthographic knowledge and speed of processing – skills known to be involved in decoding.

Generally, the findings of Study 1 indicated that Punjabi, Hindi and English reading comprehension support the components of the simple view of reading. Three models were developed as outlined in Figures 5.1-5.3 (presented in Chapter 5). While reading comprehension in the three languages seemed to be similar following the SVR, minor differences due to the orthographic transparencies were evident, too. Orthographic knowledge appeared to predict Punjabi and Hindi reading comprehension amongst younger children while the same knowledge seemed to predict English reading comprehension amongst older

readers. In English, phonological processing played an important role in initial years of literacy development (Grades 2 and 3). Speed of processing was also found as a significant predictor of reading comprehension in the current study, similar to English as proposed by the component model of reading. Overall, analyses demonstrated that similar cognitive-linguistic skills including listening comprehension, decoding, and orthographic knowledge predict reading comprehension in Punjabi and Hindi. However, considering English reading comprehension, the results demonstrated that some variations in these predictors; listening comprehension, decoding, orthographic knowledge, phonological processing and speed of processing appeared to predict reading comprehension in English.

Since the dominant languages in the current data obtained from trilingual children seemed to be Punjabi and Hindi, it was of great interest to investigate the influence of skills in these two languages on reading comprehension in English as the participants' third language. To this end, further analyses were conducted and reported in Study 2.

1.2.2 Study 2: - Cross-linguistic influence of Punjabi and Hindi on English reading comprehension among multilingual children from Punjabi region, India

The primary objective of Study 2 (see Chapter 6) was to investigate the cross-linguistic influence of Punjabi and Hindi on English reading skills on the basis of a multilingual reading model developed in the Study 1 of this thesis (reported in Chapter 5, Figure 5.3). To this end, the same multilingual Punjabi speaking children (from Grades 2 to 5) were assessed with the reading measures of Punjabi, Hindi and English; the measures which were proved to reasonably indicate the participants' Punjabi, Hindi and English reading ability reported in Study 1 (see Chapter 6 for more details).

The specific trilingual context under investigation allows a further opportunity to investigate whether cognitive-linguistic skills in relatively similar orthographies, such as Punjabi and Hindi could support or interfere reading acquisition the third language (English) with a relatively complex orthography.

The analyses for this cross-linguistic study included six measures selected from the assessment battery utilized in Study 1. The English reading comprehension measure was used as the dependant variable and five other measures including: Listening comprehension, Pseudo-word reading, Deletion task, Word chain task and RAN objects in three languages were considered as the independent variable in this study. The results found to be consistent with the English reading comprehension model as proposed for the multilingual children in Study 1 which also support the contribution of two main components of simple view of reading to English reading comprehension. Along with these findings the of cross-linguistic influence listening comprehension and orthographic knowledge skills in Punjabi and Hindi helps to acquire English reading comprehension, but phonological processing in Punjabi and Hindi may be associated with poorer scores in English reading comprehension. This helped to develop a cross-linguistic model for English reading comprehension (see Figure 6.1, Chapter 6).

1.3 Discussion of the ideas

Reading comprehension is a complex process which requires various skills. A number of models has been proposed to explain the skills involved in this process enabling readers to comprehend written texts. Findings from the reading research literature support the relationship between underlying cognitive skills which may predict literacy learning skills across a number of languages. Additionally, as Perfetti and Harris (2013) stated ‘reading

process depends on the language of the reader and the writing system that encodes that language’.

Similarly, Seymour, Aro, and Erskine (2003) also investigated early literacy in 14 European languages varied in orthographic depth and phonological complexity by assessing their letter knowledge, word reading, and non-word reading. The findings reveal that the children acquire accurate and fluent reading before the end of first year of their schooling in all languages, with some exceptions in French, Portuguese, Danish and English. The authors ascribed these results to linguistic differences in syllabic complexity and orthographic depth. They also found that the rate of reading development in English is more than twice as slow as in the shallow orthographies. Thus, it was concluded that deeper orthographies require a dual logographic and alphabetic foundations for reading in any other shallow orthography. The results from Study 1 of this thesis on predictors of reading comprehension of Punjabi, Hindi and English also investigated the predictors of three different languages and compare these predictors among two alphasyllabic and one alphabetic orthographies. It revealed from the results that all three languages support the contribution of the two main components of the simple view of reading, and predictors of Punjabi and Hindi are similar to English.

Abu-Rabia and Sanitsky (2010) studied the contribution of bilingualism to trilingualism; that is, the influence of learning two different orthographies on learning a third. The findings revealed that differing orthographies in depth are helpful in acquisition of an additional language. The results from Study 2 of the current thesis on the cross-linguistic influence of Punjabi and Hindi on English reading comprehension also support the transfer of Punjabi and Hindi reading skills to English with some interesting exceptions (see Chapter 7 for detail).

1.4 Structure of the thesis

The current thesis is organised in seven chapters. It begins with an overview to the whole thesis (current chapter), followed by Chapter 2 which provides a selective review of the current published research on reading. Chapter 3 presents Punjabi and Hindi languages and orthography. Chapter 4 explained the procedure of developing measures. Chapter 5 and 6 present Study 1 and 2 detailing the research design, measures, participants, statistical analyses and the findings. Chapter 7, the final chapter of the current thesis, is an attempt to discuss the findings which may inform the development of universal models of reading. Additionally, Chapter 7 presents the practical implications of this work which should support educators in their day to day classroom teachings. It also serves as the final point to state the limitations of the study and to suggest the directions for future research.

Chapter 2

Literature Review

2.1 Introduction

To comprehend the meaning from a text is the ultimate goal of reading. The ability to accurately decode the written word and subsequently comprehend its message is a daily requirement because, in addition to education and employment, cultural and social endeavours also rely on reading. To comprehend the text, readers are required to go through many processes including word, sentence and text level skills. However, comprehension is not limited to only these skills and also highlighted the need for integration of general word knowledge; motivation and interest; metacognitive skills; and positive reinforcement of text structure. Thus, a process that integrates different sources of information from lexical features to the world knowledge seems essential to comprehend the text.

Reading research in the last few decades has empirically enhanced fundamental insights into the mechanisms and nature of processes involved in reading comprehension. Many theoretical models of reading comprehension have been proposed to capture these processes; these models vary from more expanded models, like construction-integration model (Kintsch, 1988, 1998), to the simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Chapman, 2012). All these models explained how to decode orthographic symbols to comprehend texts. Thus, decoding, is the written form of a language, which involves the processes of word recognition. This has received much attention by many researchers, who proposed several models to explain these processes. Of these models the dual-route model (Coltheart & Coltheart, 1997) and the triangle model (Plaut, McClelland, Seidenberg, & Patterson, 1996) are most prominent in the research literature. The models of reading comprehension and word recognition are discussed in the following sections of this chapter.

The cognitive skills at early reading acquisition, with a focus on relationships between oral language and the written form of the language, are also explored in this chapter. Furthermore, this chapter will highlight the current research literature on Indian languages. Finally, the literature on multilingual cross-linguistic studies will be discussed.

2.2 Theoretical models of reading comprehension

In this section, the different models of reading comprehension are discussed, which provides the general background knowledge of all models and highlights the complexity of reading comprehension processes. This section is concluded with an explanation of the simple view of reading and the component model of reading (only the cognitive component), the two models of reading comprehension that are used as general guidelines for the present research.

2.2.1 Stage models of reading development

The main focus of the developmental theories is to see the effect of age on skill acquisition. Frith (1985), argued that biological, cultural, genetic and educational influences played important roles in developing these different skills with increasing age. The stage model theorist explained the stages in developing reading skills in an alphabetic orthography, which begins logographically and terminates orthographically. Several researchers have tried to develop a model that explains the stages involved in the reading comprehension process (Chall, 1996; Ehri, 1995). Chall (1996), developmental model explained six stages in developing reading comprehension among children. During the first stage, readers acquire skills such as book handling, print concepts, letter knowledge and phonemic awareness. The second stage consists of formal literary acquisition in school and beginning to develop decoding skills. The third stage involves consolidating the decoding ability, building sight vocabulary and increasing fluency, while the fourth stage is marked by the shift of children

from ‘learning to read’ to ‘reading to learn’. Finally, the fifth and sixth stages demonstrate the abilities of children to comprehend more complex texts and to successfully synthesise them.

While stage models have provided a useful conceptual framework of the various phases for developing and acquiring proficient reading comprehension, they have also been criticised for their neglect of individual differences among readers and orthographic transparency differences among languages. There have also been claims that they ignore the overlapping order in acquiring skills, for example while acquiring decoding skills (at stage 2), they are unable to show any indication of ‘learning to read’ (at stage 4) in certain contexts (Paris & Hamilton, 2009). The next sections consider some other models to provide the general understanding of the processes of reading comprehension.

2.2.2 Constructionist-integration model of reading comprehension

The constructionist-integration (CI) model (Kintsch, 1998) is the basis of many other models of reading comprehension. This model presents knowledge and memory as a network, means knowledge comes from the prior and/or current sentence and related knowledge of the text, while integration involves to use this this knowledge to comprehend the text. The CI model involves three phases of comprehension: surface structure, propositional ‘text base’ and situation model. The basis of the structure level are words and syntactic structure of text, and the propositional level is based on the text’s representation in the simplest propositional form. Finally, the situation model goes beyond the text and includes information not explained in the text, where inferences are divided into automatic and controlled, and retrieved and generated inferences.

As per the CI model, coherence is based on the degree of knowledge incorporated and activated through mental representations, but it also depends upon the automaticity and

linking of propositions to discourse representation. The success rate of comprehension will increase if the reader has prior knowledge of the topic. There are other theories related to comprehension which have been built on the CI model, such as constructionist-integration model of (Kintsch, 1998) and the landscape model (Rapp, Broek, McMaster, Kendeou, & Espin, 2007). The landscape model differs from CI in activation of the concepts, which can be both automatic and strategic. Automatic activation is similar to the CI model, whereas strategic activation requires effort to find out the meaning from the text. These models explain the different levels of assessments ranging from the structural level to whole texts.

The CI model seems most appropriate in the context of expert readers (adults), but in terms of children it fails to address the processes of comprehension such as extraction of information and construction of meaning. Similarly, it does not explain how an individual develops the skills to integrate text base and inference base, which are essential for comprehending reading passages. Both CI model and the stage model highlighted the complexities of the reading comprehension. To deal with these complexities, models such as the simple view of reading and component model of reading gives information about children's reading development.

The next section considers these two models to provide general understanding of the processes of reading comprehension. The simple view of reading has provided the theoretical framework for the current research.

2.2.3 Simple view of reading

Reading comprehension is a complex process involving various cognitive procedures. One of the cognitive models that explains these processes is the simple view of reading (SVR) proposed by Gough and Tunmer (1986); Hoover and Gough (1990), according to whom the two elements most important for reading comprehension(R) are: decoding (D) and linguistic comprehension (LC). The first element, word decoding, comprises the skills of print concepts,

letter knowledge, phonemic awareness, phonics and spellings which includes the visual skills, visual phonological skills and visual morphological mapping, which are needed to accurately derive the meaning from written words. Word decoding skills are generally assessed using the measures of single word/pseudo word accuracy and fluency. The second element, linguistic comprehension, includes the skills that are shared with language, such as semantics, syntax, pragmatics and vocabulary. Linguistic comprehension is often assessed by using a measure of listening comprehension. The relationship between these two elements is expressed as the formula: $R = D \times LC$.

This equation depicts the multiplicative relation between decoding and linguistic comprehension, which means that it is not possible for reading comprehension to exist without an ability to decode words (regardless of linguistic skills) as well as the ability to understand the words that are decoded (regardless of how strong the decoding skills are). Consequently, when both decoding and linguistic comprehension is assessed as whole, these two elements should explain maximum variance in reading comprehension.

Gough and Tunmer (1986), proposed the idea of SVR, which attempts to define the role of decoding and comprehension in the process of reading comprehension. They believed that if decoded words can be understood, then the text should be read and understood successfully. Thus, both decoding and comprehension are essential for successful reading comprehension. For example, a reader of one language can decode the words in other similar languages, but since they cannot understand the decoded words, they do not have reading comprehension. Hoover and Gough (1990), conducted a longitudinal study on 254 Spanish-English bilingual children (from Grades 1 to 4) to examine the contribution of decoding and listening comprehension to their reading comprehension. The results revealed that components of SVR explained 72 to 85 percent of the variance in reading comprehension. Adlof, Catts, and Little

(2006), supported these results with their cross-sectional study on children in grades 2, 4 and 8, and reported that 100 percent of variance in reading comprehension was contributed by decoding and comprehension. Tunmer and Chapman (2012), conducted a similar study with 7-year-old children (n=122) and confirmed the two fundamental components of SVR—decoding and linguistic comprehension. Additionally, in their factor analysis they also reported that vocabulary and listening comprehension is highly loaded on linguistic comprehension component. Therefore, both vocabulary and listening comprehension should be considered as the elements of the linguistic competence in the model, and linguistic comprehension influenced reading comprehension not only directly but also indirectly through the decoding.

There are several studies in support of the SVR that have investigated the role of linguistic comprehension and decoding skills in the development of reading comprehension. Catts, Adlof, and Weismer (2006) and, Joshi and Aaron (2000) tested this model's validity and also demonstrated that the SVR accounts for between 40 to 80 percent of the variance in reading comprehension. These studies also demonstrated that in the early years of learning reading skills, children predominately depend on the processes required in word decoding, while this relationship of decoding and linguistic comprehension has changed in later stages and linguistic comprehension became the dominant variable by grade eight (Catts et al., 2006). Landi (2010) also demonstrated this shift, whereby word decoding skills were found to contribute less to reading comprehension amongst a group of skilled adult readers.

The SVR seems not only applicable to English orthography but also to other orthographies. Joshi, Tao, Aaron, and Quiroz (2012), compared Spanish, a transparent orthography, and Chinese, a complex orthography among primary school children. They reported that both components of SVR could explain the 60 percent variance in reading comprehension among

Spanish children (at Grades 2 and 3). They also reported that word decoding and linguistic comprehension explained 25 and 40 percent of the variance in Chinese reading comprehension (at Grades 2 and 4). Kendeou, Papadopoulos, and Kotzapolou (2013), also examined the SVR in a transparent Greek orthography and their findings strongly support the validity and contribution of decoding and comprehension components of SVR to Greek orthography. Similar results were found by Sadeghi et al. (2016). They also confirmed that SVR is not only explains the cognitive processes involved in reading comprehension but also helps to identify the different types of barriers to reading comprehension. Aaron et al. (1999), also studied 198 students in grades 3, 4 and 6 and reported that eight percent of students had either problem in decoding or linguistic comprehension skills and another eight percent had problems in both skills. Also see Catts et al. (2006); Roch and Levorato (2009) for further review.

The SVR is not strong enough to capture orthographic knowledge as an independent predictor of reading comprehension in other orthographies such as Persian (Sadeghi et al., 2016). Florit and Cain (2011), also presented a meta-analysis to test the validity of SVR and reported that at early stage of language acquisition the contribution of decoding and linguistic comprehension to reading comprehension varies among readers of different orthographies. This points to the need for additional components in the model and to use the measures as per the orthographic need of the language or languages. The present study is a step towards this.

Despite providing a simple explanation of the complex process of reading comprehension, the SVR neglects to provide an explanation of the complex interaction of word decoding and linguistic comprehension with their constituents and other variables such as motivation, working memory, vocabulary knowledge and background knowledge of the reader and speed of processing (Aaron, Joshi, Gooden, & Bentum, 2008). Other models of reading

comprehension have added additional elements to the SVR to attempt to address the concerns discussed above. For example, Tunmer and Chapman (2012) added a vocabulary measure to the model and included as a linguistic comprehension component. Joshi and Aaron (2000), also proposed a component model of reading (CMR), which is described in further detail below.

2.2.4 Component model of reading

Joshi and Aaron (2000), utilised the SVR as a foundation and favoured its two main components: word decoding and linguistic comprehension. They also explored the role of speed in the process of reading. They undertook a study with elementary school children to identify whether an additional factor of speed, when added to two basic components of SVR, improved the ability to predict reading comprehension. The results showed that both decoding and linguistic comprehension could explain 50 percent of the variance in reading comprehension, and speed of processing explained a further 10 percent. Therefore, the authors proposed a revised version of SVR presenting the formula: $R = D \times LC + S$, here R= reading comprehension, D= decoding, LC= linguistic comprehension and S= speed. The speed of processing (additional factor) was considered as an additional rather than a multiplicative component, as the researchers did not consider it to be entirely independent of word decoding. They also suggested that speed only emerges as an important factor among older children (at Grade 4), before they rely heavily on word decoding and building sight vocabularies. Once children have consolidated these skills, speed emerges as an important factor.

Aaron et al. (2008), further investigated the potential of CMR to identify reading disabilities among school children. This updated version of CMR comprised three domains: the psychological domain, cognitive domain and ecological domain. The authors argued that to

acquire a satisfactory level of literacy, all these three domains are important. The authors also validated the cognitive domain of reading in their study on 204 children from grades 2 to 5. All participants were assessed on the measures of reading comprehension, listening comprehension, word decoding, and processing speed of letter naming. The results supported the SVR with D and LC, which accounted for the variance between 38 and 41 percent in reading comprehension, and a further 11 percent was contributed by the speed of processing. However, in fifth grade, this element of speed decreased to just 2.5 percent of the variance. Sadeghi et al. (2016), also supported these findings and contribution of speed of processing to reading comprehension.

The CMR like other psychological theories has not gone unchallenged. Adlof et al. (2006), studied 604 children in grades 2, 4 and 8 assessing them on measures of reading skills, which explained 97 percent of the variance in reading comprehension. The findings were similar to SVR, but were at odds with CMR and showed that speed should not be considered as a separate component to the model of reading. These findings suggest that speed of processing is basic source in all tests of cognitive skills. These findings demanded further research which assess the speed of processing with a variety of task of RAN (random automatized naming) in different orthographies (Georgiou, Aro, Liao, & Parrila, 2016). In the research reported in this thesis, speed of processing was assessed using the measure of Rapid Automatized Naming (RAN) objects to address the role of speed in Punjabi and Hindi orthographies.

2.2.5 Summary of reading comprehension models

Most well-established models of reading comprehension, such as constructionist-integration (Kintsch, 1988, 1998) and the stage model (Chall, 1996) emphasise that word identification is acquired by graphemic encoding of the word, and word meaning is derived either directly from this grapheme or phonological code. The ability to comprehend the meaning of words in

context depends upon how successfully readers can recognise and decode words. Thus, understanding the decoding process is essential, which also involves the skills of orthography and phonology. In the same way, the SVR and CMR consider reading comprehension through understanding of language and decoding of the written language. These two components have proved to be essential for successful reading comprehension (Aaron et al., 2008; Adlof et al., 2006; Catts et al., 2006; Protopapas, Simos, Sideridis, & Mouzaki, 2012).

As discussed above, comprehension cannot take place without learning word identification and the meaning of words. Thus, to understand the reading comprehension, each of the components needs to be adequately understood. Like reading comprehension models, many models and theories of word recognition have been proposed in the literature. The two prominent models of word recognition: the dual-route model (Coltheart, 1985) and triangle model (Plaut et al., 1996), are presented in the next section of this chapter.

2.3 Theoretical models of word reading

Word reading/recognition is the first stage of successful reading. Hoover and Gough (1990) suggested the print-dependent component as a measure of decoding, and in SVR they defined it as efficient word recognition. Gough and Tunmer (1986) defined decoding skill as the ability “to read isolated words quickly, accurately and silently” (p. 7). Perfetti and Harris (2013) argued that learning to read is learning how one’s writing system encodes one’s language. In the alphabetic writing system, decoding refers to the ability to decode letters by applying grapheme-phoneme correspondence rules. Cain (2010) suggested the paucity in the literature on examining the available models on word recognition which tend to explicate how the reader accesses the pronunciation of a letter string. The next section explains two prominent models of word reading: the dual-route model (Coltheart, 1985; Coltheart, Rastle,

Perry, Langdon, & Ziegler, 2001) and triangle/connectionist model (Plaut et al., 1996) as the theoretical base of the research reported in this thesis.

2.3.1 Dual-route model

The dual-route model was proposed by Coltheart (1985) and Coltheart et al. (2001) and suggests that there are two routes in the word recognition process: the direct route and indirect route. These two routes are also known as lexical routes and non-lexical/sub-lexical routes. When a reader processes a word, both routes are activated simultaneously (Coltheart et al., 2001) and the route that wins the race decides the pronunciation. Words that are learnt by the reader are stored in their mental dictionary or inter-lexicon. Thus, the visual representation of the words or written form of the words can activate their meaning faster. However, association between the written form of the word and its meaning is arbitrary and must be learnt through experience. The indirect or non-lexical/sub-lexical route uses the grapheme-phoneme correspondence rules to translate the letter strings into pronunciation through which access to the lexicon is provided. Thus, this phonological route indirectly relates a written word to its meaning.

The dual-route model is used not only to explain normal word recognition and reading, but also to identify reading disorders. As previously discussed, learnt words are stored in the mental lexicon, so readers with surface dyslexia and brain damage can recognise the word with lexical and non-lexical routes. Studies (Coltheart, 2005) on reading disorders showed that the dyslexic readers used two different routes for recognising words. People with brain damage could read by non-lexical routes (see Coltheart, 1996 for further details on these studies). The next section will provide information about another model of word recognition.

2.3.2 Triangle or connectionist model

The triangle model is the connectionist model of word reading proposed by Plaut et al. (1996) in which reading words involves connections between phonology, orthography and semantics. Rather than looking at the different pathways, this model assumes readers use phonology, orthography and semantic information at the same time to read words. In this model, there are interactions of phonological pathway between the graphemes and phonemes as well as semantic pathways, which map the graphemes and phonemes through meanings. In the triangle model, due to the influence of semantics on word reading, the words more familiar in meaning can be read with greater ease than the words that are less familiar in meaning.

In the triangle model, children at early stages seem to be more dependent on phonological pathways and later they depend more on word meaning and gain fluency in reading, which can be due to more reliance on semantic pathways (Snowling, 2004). So, the triangle model works through the neural networks and believed that the sources of information work side by side in a parallel mode while supporting each other (Cain, 2010).

2.3.3 Summary of word recognition models

To conclude, the aforementioned models of word recognition: the dual-route model and triangle model depict the processing of word recognition through phonology and orthography. Both models suggest that words can be read either by a lexical route or non-lexical route. However, both models are different in terms of processing. In the dual-route model, the word knowledge is stored as lexicon entries and processing of it occurs through separate routes. In contrast, in the triangle model, the word recognition process is parallel. Similar to the dual-route model, this model also involves direct and indirect routes. The direct route is via orthography and phonology, and the indirect route is via semantics (Coltheart, 2005). Both the triangle and dual-route models explain isolated word recognition process and many

reading difficulties. However, there is paucity of research focusing on the application of both models (Cain, 2010).

The ultimate aim of reading is to comprehend the meaning from the written form of the language, and investigation into cognitive skills involved in reading comprehension seems essential to develop models of reading comprehension at word level. The next sections of this chapter firstly explain the cognitive skills involved in reading comprehension, consistent with the SVR and CMR and rationalized the importance of studies in other orthographies, including studies on Indian orthographies.

2.4 Assessment of cognitive skills involved in reading

The SVR model argues that reading comprehension can be enhanced through successful word reading and understanding of the language (Gough & Tunmer, 1986). The dual-route and triangle models of word reading proposed that phonological and orthographic skills are essential for successful word reading. Similarly, Ehri (2005) developed a theory of sight word reading, which involves the construction of links between written and spoken language to bond spellings of the word to their pronunciation and meaning in the memory. Therefore, the knowledge of phonology and orthography is essential for successful reading. Further, research has shown that understanding of the language is also required for a strong foundation of reading (Catts et al., 2006; Joshi & Aaron, 2000). It is also important to consider speed of processing as suggested by CMR (Joshi & Aaron, 2000; Joshi et al., 2012). In next section, linguistic comprehension skills, decoding skills, phonological awareness skills, orthographic awareness skills, and speed of processing will be discussed.

2.4.1 Linguistic comprehension skills

Linguistic comprehension is the one of the contributing components of reading comprehension outlined in the SVR, the definition of which is “the ability to take lexical

information and derive sentence and discourse interpretation” (Hoover & Gough, 1990) (p.131). Whereas decoding refers to the process of identifying written text and then applying grapheme-phoneme correspondence rules, linguistic comprehension refers to the ability to interpret the words and sentences that have been decoded previously. For assessing linguistic comprehension commonly measure of listening comprehension used (Adlof et al., 2006; Hoover & Gough, 1990; Joshi & Aaron, 2000). Other researchers (Florit & Cain, 2011; Gough & Tunmer, 1986) also advocated listening comprehension as higher mental processes that define the ability to acquire word level information and extract the sentence and discourse interpretations and can be assessed as the ability to answer questions about the text aurally presented.

In the literature, listening comprehension has been mostly used (Adlof et al., 2006; Hoover & Gough, 1990; Joshi & Aaron, 2000) to assess linguistic comprehension. The reason for this can be understood from the study conducted by Juel, Griffith, and Gough (1986). They argued that for successful reading, listening comprehension plays a crucial role, because to comprehend the meaning from printed text, the reader needs the same mechanism used in comprehension from the spoken language: the same knowledge of morphology, syntax, pragmatics and semantics. They also emphasise the fact that the quality of reading comprehension depends upon the quality of readers’ listening comprehension. Similarly, research shows that there is a strong relationship between reading comprehension and listening comprehension; especially the correlation of these two components is particularly strong as children grow older (Gough & Tunmer, 1986; Hoover & Gough, 1990)

Tunmer and Chapman (2012) argued that vocabulary should be considered a constituent of the linguistic comprehension component in the SVR (see Tunmer and Chapman for more detail), although Wagner, Herrera, Spencer, and Quinn (2015) reviewed their way of

analysing the data and argued that Tunmer and Chapman incorrectly specified their simple view of reading model and when correctly specified the SVR and an alternate model in which listening comprehension contributed to decoding provide equivalent good fit to data. Similarly in a cross-linguistic study, listening comprehension in L1 (Russian or Turkish) influenced L2 (German) reading comprehension (Edele & Stanat, 2016) among 9th grade students. Therefore, in the current study the measure of listening comprehension was developed to examine the unique variance of linguistic comprehension in text reading comprehension in three languages: Punjabi, Hindi and English.

2.4.2 Decoding skills: phonological processing and orthographic knowledge

Hoover and Gough (1990) posited the print-dependent component as a measure of “decoding skill” and defined it as “efficient word recognition”, and Gough and Tunmer (1986) originally defined decoding skill as the ability “to read isolated words quickly, accurately and silently”. Learning to read is learning how one’s writing system encodes one’s language (Perfetti & Harris, 2013). This claim reflects the view that reading is fundamentally about converting graphic input (letters, words, characters) to linguistic-conceptual objects (words, morphemes and their associated concepts). Typically, in this context, decoding refers to the ability to sound out the letters by applying the grapheme-phoneme correspondence rules. To decode, one needs to establish a grapheme-phoneme correspondence followed by chunking common spelling patterns, which helps to retrieve words from memory. Therefore, a vital part of this process is the ability to recognise language sounds (i.e., phonological information). A range of models has already been discussed above (in section 2.3): The Dual-route model (Coltheart et al., 2001) and Triangle or connectionist model (Plaut et al., 1996), show the mechanisms of phonology and orthography in decoding the words.

Ehri (1995) emphasised the importance of phonological importance in the reading process. Phonological awareness refers to the reader's awareness and sensitivity to phonological units and sound structure of spoken words. Operationally, it involves the ability to reflect on sounds, and detect and manipulate them at different levels of sound structure: syllables, onset and rimes and phonemes. Phonological processing tasks vary and may require a range of different operations such as identifying, combining, substituting or generating sounds, which are the specific abilities that requires identifying and manipulating the sound/s within a word (Smythe et al., 2008). Data on second language learners (including English, Punjabi and Hindi, the languages of focus in this research) has also suggested the contribution of phonological skills to literacy ability (Chiappe & Siegel, 1999; Geva, Yaghoub-Zadeh, & Schuster, 2000; Gupta & Jamal, 2007; Nassaji & Geva, 1999). Similarly, phonological processing has been reported as an essential skill to achieve a successful reading level in cross-linguistic studies. Smythe et al. (2008) in a study between groups with five different languages (Arabic, Chinese, English, Hungarian and Portuguese) assist the word level literacy by measures of phonological processing, which focused on different aspects of phonology. They found that phonological awareness explained a significant amount in word reading in all cohorts and also found that phonological awareness and decoding are the best predictors of word level literacy in Arabic and English, which are considered inconsistent orthographies. This similarity is of importance in the context of this thesis, since Punjabi, Hindi and English are the languages with inconsistencies. Similarly, Lee (2008) studied Malay children and found that phonological awareness is the best predictor of word level reading skill in Malay.

Cross-language studies conducted in different orthographies also demonstrate that phonological awareness may be a common factor across languages, and the ability to predict

literacy level varies with orthography (Everatt et al., 2010; Georgiou, Parrila, Kirby, & Stephenson, 2008). However, the mediation of phonological processes in reading comprehension is not undebatable (Coltheart & Coltheart, 1997). Therefore, more cross-language studies on languages varying in orthographies would be useful.

On the other hand, orthography is the written representation of language, which internalises the knowledge of sound-symbol relationships and orthographic conventions. In reading research, to study how an orthography represents any specific spoken language is of great appeal since reading is encoding graphic representation of one's language (Perfetti & Harris, 2013). The relationship between the graphic representation and its sound system provides the basis for the classification of the different orthographies as consistent or inconsistent orthographies.

Inconsistent or less transparent orthographies refers to the relative ease of deriving phonology from orthography due to an inconsistent relationship or poor correspondence between grapheme and phoneme. For example, English orthography is polyphonic because graphemes can represent more than one phoneme (sound). In English, some phonemes can be represented by different graphemes, which makes it polygraphemic. This is why English is known as opaque or deep orthography. In contrast, with consistent or transparent orthographies, the grapheme to sound relationship is more consistent or has one-to-one association. Orthographies like Punjabi and Hindi are believed to be relatively shallow orthographies with one-to-one grapheme-phoneme correspondence (Bhatia, 1993, 2008). However, Punjabi and Hindi (Kumar et al., 2010) are visually complex orthographies (see Chapter 3 for further details).

Learning to read has been shown to be strongly related to early language skills particularly phonological processing abilities (Goswami, Gombert, & de Barrera, 1998). To be a skilled

reader, one should not just depend on the phonological ability (Snowling, 2004). Many researchers have argued reading is much more than just phonological ability, and as the SVR and CMR suggest, reading is the product of two inter related skills: decoding and linguistic comprehension (as discussed in sections 2.2.3 and 2.2.4). In common parlance, learning to read may depend upon the writing system used to map the spoken language (Perfetti & Harris, 2013). However, the relationship between written form and language varies across the orthographies (Zeguers, Snellings, Huizenga, & van der Molen, 2014; Ziegler & Goswami, 2005).

Results from research on reading maintains that the readers of transparent orthographies can rely on grapheme-phoneme correspondence rules, whereas the readers of opaque orthographies rely more on whole word reading (Wimmer & Goswami, 1994). Katz and Frost (1992) tested the Orthographic Depth Hypothesis (ODH), which revealed that word reading processes are different across orthographies and writing systems and their consistency of grapheme-phoneme correspondence affect word recognition processes. Transparent orthographies (e.g., finish and Italian) are processed via non-lexical routes of grapheme to phoneme correspondence, but complex orthographies require lexical procedures in their word recognition processes.

In complex orthographies, the reading development process is slower than in transparent orthographies (Smythe, Everatt, Gyarmathy, Ho, & Groeger, 2003). However, research has shown that reading processes depend upon the language and the writing system that encodes that language (Perfetti & Harris, 2013) but most of reading theories and models have been derived from studies on the English language, which lacks consistency (i.e. letter-to-sound correspondence is not one-to-one) (Share, 2008). Therefore, research on other orthographies is required to examine and confirm the current models, which are derived from English.

Decoding skills have also been shown to predict comprehension in reading comprehension models (e.g., the SVR and CMR). Early decoding is heavily dependent on letter-sound relationships. Letter-sound knowledge is also required to consolidate orthographic representation needed for automatization of sight word knowledge (or silent word reading) (Ehri, 2005). Sufficient knowledge and experience of words are essential for readers to recognise words automatically as they read text, which helps achieve successful comprehension.

Orthographic knowledge is also a strong predictor of word decoding independent of phonological processing, so it is considered a proximal factor in linking written forms with their pronunciation (Ehri, 2005). Moreover, orthographic knowledge was also found to foster reading comprehension through accurate and effortless word reading (Apel, 2011). Many studies on different orthographies examined orthographic knowledge and results revealed the direct contribution of orthography to reading comprehension. (Nag, 2007; Sadeghi et al., 2016). The findings from current research are discussed (see Chapter 7 for further details) the role of orthography both in word decoding and reading comprehension of Punjabi, Hindi and English reading comprehension.

2.4.3 Speed of processing

In component model of reading (CMR) (Joshi & Aaron, 2000), the role of speed of processing in reading comprehension was assessed and results were similar to the simple view of reading (SVR), where listening comprehension and decoding were good predictors of reading comprehension and also suggested that with listening comprehension and decoding, a measure of speed of letter naming should be included in the SVR. However, there is debate in the literature regarding the significance of speed of processing measures. Some researchers consider that rapid naming task should be considered as a phonological task (Wagner,

Torgesen, Laughon, Simmons, & Rashotte, 1993) because the naming task primarily retrieve the stored phonological units in long-term memory stores. On the other hand, researchers such as Cronin and Carver (1998) and Georgiou et al. (2016) tend to assume naming speed tasks as indicators of general processing speed of the cognitive system. Hence, interpretation of the same task can vary on the use of it as general cognitive speed or as a more specific feature of phonological processing.

Many studies with consistent orthographies indicated that the measure of reading speed may be more reliable for individual differences in word level processing than reading accuracy (Wimmer, Mayringer, & Landerl, 2000). Speed in these cases should be considered as a measure of word decoding fluency. It is easy to attain the accuracy level of decoding where the script is transparent, but among poor readers, this may not be that easy leading to poor levels of fluency. Likewise, it is evident from the research that single word reading speed is accountable for success in reading comprehension (Perfetti, 1985). If a child has difficulty at a word reading level, this will reasonably have a negative impact on their reading comprehension level. To achieve meaning from the text, children are initially required to be fluent in decoding at the word level. Therefore, speed in this case is specific to the task of reading and again may need to be considered separately from the measures of rapid naming.

However, rapid naming was first identified as a strong predictor of reading abilities among young dyslexic English readers by Denckla and Rudel (1976). These researchers developed the Rapid Automatized Naming (RAN) test, which has been used as standard form of assessment of naming speed. Further research has shown RAN to predict reading not only for alphabetic orthographies (e.g., English) but also no-alphabetic orthographies (e.g. Chinese) (Georgiou et al., 2016; Georgiou, Papadopoulos, Fella, & Parrila, 2012; Li, Kirby, & Georgiou, 2011; McBride-Chang & Ho, 2005).

RAN has also been shown to be a predictor of reading that is independent of phonological processing and can assess reading disabilities among children. For example, Wolf and Bowers (1999) examined the roles of phonological processing and RAN in diagnosing reading disabilities among children and the findings revealed that phonological processing and RAN contributed to different aspect of reading and RAN should not be subsumed under phonological processes. Likewise, among normal readers, RAN contributed a significant amount of variance in reading skills beyond that accounted for by phonological processes. For instance, Kirby, Parrila, and Pfeiffer (2003) conducted a longitudinal study where they assessed phonological processing and RAN in reading development of children from kindergarten to fifth grade and results showed that phonology was strongly related to reading at the initial two years of reading development, and weaker relation of naming speed to reading strengthen as the grade level increased. Wolf, Bally, and Morris (1986) argued that children with weak phonological processing and slow naming speed were most likely to develop later reading difficulties.

Therefore, because of its potential role in reading ability in different orthographies, the present research has considered the role of speed in Punjabi, Hindi and English orthographies.

2.5 Assessment of reading comprehension in different orthographies

The level of complexity of an orthography suggests the variations in reading development. Smythe et al. (2003) studied 14 different orthographies (cross-linguistically) with letter knowledge, familiar word reading and simple non-word reading, and results showed that syllabic complexities affect decoding, and depth of orthography affects word reading and non-word reading. They also stated that reading development in the English language is two times slower than the consistent orthographies.

Similarly, Georgiou, Torppa, Manolitsis, Lyytinen, and Parrila (2012) examined the longitudinal predictors of reading and spelling in three languages that vary in orthographic depth (Finnish, Greek and English). They examined the children prior to any reading instruction with measures of phonological awareness, letter knowledge and rapid naming speed. In grade 2, they were tested on measures of non-word decoding, text reading fluency and spelling. The results showed that the model of non-word decoding in Greek was similar to Finnish due to the consistency of phoneme-to-grapheme correspondence. On the other hand, the model of spelling in Greek was found to be similar to English, due to some inconsistencies of phoneme-to-grapheme correspondence.

Punjabi and Hindi orthographies are of interest because of their unique alphasyllabic features, and consistent because of one-to-one phoneme-grapheme correspondence (Bhatia, 1993) but they are visually complex due to their non-linear writing systems (Kumar et al., 2010). Hence, learners of these languages have a large range of orthographic symbols they need to learn in order to be skilled readers (see Chapter 3 for details on Punjabi and Hindi languages and orthographies), as well as a number of rules for how written symbols vary in form and are combined together. Once these rules are learnt, both scripts are relatively transparent in their relationships of phoneme-to-grapheme, but the visual orthographic complexity may create challenges for multilingual readers.

Gupta (2004) studied the reading difficulties of Hindi-speaking children with developmental dyslexia and found that in reading words and nonwords of different lengths, dyslexic children were slower and made more errors than chronologically age-matched controls and were worse than reading age-matched controls on reading accuracy. Gupta further notes that the reading errors among dyslexic children revealed a great number of graphemic errors and errors involving vowel substitutions or deletions. She concluded that the particular

visuospatial characteristics of the Hindi script led to certain errors and that, despite the script's transparency, dyslexic readers of Hindi show difficulty in developing phonological representations of words. Again, Gupta and Jamal (2007) compared normal and dyslexic bilingual readers in Hindi and English. In this Gupta and Jamal examined the reading accuracy of dyslexic readers in comparison to normally progressing readers and both groups showed better performance in Hindi than in English. In Hindi, among normal learners only nonword errors were observed whereas among dyslexic readers a high percentage of nonword than word errors were observed. In English, normal readers produced greater percentage of word than nonword errors, whereas dyslexic readers produced greater percentage of nonword than word errors.

Vasanta (2004) reported three experiments exploring the role of phonological and orthographic awareness on the reading strategies of primary school children in Telugu, a Dravidian language used in southern India. These children were examined on word fragment completion, rhyme judgment and generation, and sentence completion to test the hypothesis that less skilled children with only one or two years of exposure, should make more mistakes than more experienced children in spelling the secondary forms of vowels and the secondary forms of consonants in words containing consonant clusters. The results revealed that children's orthographic knowledge was directly related to their ability to access the phonological information of Telugu words. Further, it was suggested that knowledge about phonological and orthographic properties of words contributes to acquisition of beginning reading skills although the strategies children use to access meaning during reading might change at different developmental periods.

Kumar et al (2010) conducted an fMRI study of phrase reading in Hindi–English bilinguals. The aim of this study was to use functional imaging to associate cortical activations involved in reading Hindi and English that are different orthographies. The participants were a group of older bilinguals having more fluency in Hindi (L1) than English (L2). English is an alphabetic orthography with linear writing system. In contrast, Hindi is an alphasyllabary with non-linear writing system wherein vowels are placed around consonants which makes it a visually complex script. Additionally, the grapheme-phoneme mapping in English is opaque while Hindi is transparent. The results revealed that reading fluency were significantly slower and brain activations consistent with the increased visuo-spatial demands of processing. Thus, it can be concluded from the results that Hindi is visually complex orthography.

Rao, Vaid, Srinivasan, and Chen (2011) tested the significance of the orthographic depth hypothesis among biliterate readers of Hindi and Urdu. Both Hindi and Urdu are different orthographies, Hindi is a transparent alphasyllabary and Urdu is an opaque alphabetic orthography which has similarities with Arabic. They conducted two primed naming experiments and in both experiments proficient biliterate readers were given the primes in Hindi or Urdu (in Experiment one), or in Roman transcription (in Experiment two). The findings suggest that, across writing systems, orthographies that have more transparent phonological-orthographical mappings tend to elicit greater activation of phonological codes in reading aloud than do opaque orthographies.

Stuart-Smith and Martin (1997) investigated literacy and pre-literacy skills (such as phonological awareness) of Panjabi-English bilingual school children. Their results led to the argument that the assessment of pre-literacy skills in bilingual children is useful only if

carried out in both of the children's languages. Similarly, Chiappe and Siegel (1999) have also examined phonological awareness and reading acquisition in English and Punjabi speaking Canadian children. They examined whether in the process of reading acquisition the components for both native and non-native speakers of 1st grade are same. For this they examined the performance of 88 children on tasks of reading skill, phonological processing and syntactic awareness. Out of 88 fifty children were native English speakers (LI), and 38 children were from Punjabi-speaking families (who has English as second language). The results revealed the similar pattern of errors in word reading among both native and non-native children, yet error pattern for average and poor readers was different. Overall, for both native and non-native children, reading difficulties appeared to be strongly linked with the impaired phonological skills.

Many studies have been conducted on Indian languages (Nag, 2007; Nag, Caravolas, & Snowling, 2011; Nag, Snowling, Quinlan, & Hulme, 2014; Nag & Snowling, 2011; Sircar & Nag, 2013) and have reported the various predictors involved in different Indian orthographies. In these studies, it is reported that literacy acquisition in Kannada (an Indian language) was full of challenges due to the mismatched mapping, word level differences in children's awareness, and visual complexity of the orthography. In Indian languages, it is also reported that children who are skilled readers show greater phonemic awareness and can exploit the segmental information within orthographic units (Nag & Perfetti, 2014).

2.6 Assessment of cross-linguistic transfer among multilingual/trilingual readers

The bilingualism has been studied from last two decades. Many studies have conducted on bilingual children which not only throw the light on the processes involved in acquiring reading skills in two languages but also consider the relationship between first language and

second language and also reveals that how reading skills in one language influenced the reading skills in other language (Cheng, 2012; Koda & Reddy, 2008; Leikin et al., 2010; Schwartz et al., 2008; Zhang & Koda, 2014). Trilingualism is always viewed as sub-category of bilingualism. Limited research has looked into the trilinguacy and very limited research is on cross-linguistic transfer/influence of language one, language two on language three. This research has explored the cross-linguistic transfer in reading skills across Punjabi, Hindi and English. There are some studies on cross-linguistic transfer/influence.

Reading development in trilingual readers is a very complex process and cross-linguistic transfer is even a more complex phenomenon among these children since it involves a number of factors that may interact with transfer. Trilingualism has only recently started to attract attention. As a result, Cenoz (2001) studied the role of age, status of second language and typological distance in trilingual children who learned English as third language. The results showed that older children transferred more into English than the younger children. Similarly, Abu-Rabia and Sanitsky (2010) examined the contribution of bilingualism to trilingualism and results were in favour of transfer of skills across languages of different orthographies, not only in bilinguals but also with higher efficiency in trilingual readers.

Bérubé and Marinova-Todd (2012) investigated the development of second and third language skills and literacy proficiency in multilingual grade 4 children. The results reveal that children whose first language typology was similar to the target second and third language developed stronger oral language and reading proficiency in additional languages, particularly vocabulary was more predictive reading comprehension skills in second and third language.

In literature, there are some theories developed on cross-linguistic transfers of one language to another language. For example, Cummins (1978) proposed the interdependence hypothesis,

which hold that Cognitive Academic Language Proficiency (CALP) is transferred from one to another. It also posits that a minimum level of linguistic competence in first language may affect the competence in another language. Therefore, low level of competence in L1 may lead to low level of competency in L2, and higher level in L1 will lead to the high level of competency in L2. Cummins (1984) states “To the extent that instructions in a certain language is effective in promoting proficiency in that language, transfer of this proficiency will occur, provided there is adequate exposure to that other language and adequate motivation to learn that language” (p.132). This hypothesis suggested that reading instructions in one language leads to the general language competency, which strongly related to the competency in another language. Overall, Cummins suggests that underlying cognitive skills are common across languages, which leads to the high transfer of literacy related skills. This argument is supported by a number of studies (Leikin et al., 2010; Talebi, 2014)

Similarly, Cook (2003) believes that the first language and the other language/s are in the same mind and learning of all these languages must develop a language super-system instead of the separate system for each language. The researcher further explains three possible models for the relationships of languages in the brain: the first is the separation model, which keeps the languages in the water tight compartments in the mind (p. 6). In this model second language learners do not connect the language in their minds, so this model cannot justify the influences from L2 to L1. The second is the integration model, which is opposite to the first model. It considers one system for different languages in same mind, which has a balanced between components of this system and there is no discussion about the influence of languages on each other. The last and third model is the interconnection model, which falls between the first and second model and has two subcategories of the model: the first is

‘linked-language model’, as per this model there are separate components of the languages which interact to each other. Second is ‘partial integration models’, driven from the concepts of the total integration model. It suggests that the system of two languages can partially overlap the areas in one mind. “it does not distinguish the between languages in the same area of overlap, but sees how the single conjoined system differs monolingual version of either language” (p. 8). The cross findings of current research are discussed in the light of the above discussed studies and models.

2.7 Summary and thesis aims

The aim of this work is to develop multilingual models of Punjabi, Hindi and English reading comprehension and to investigate the cross-linguistic influence of Punjabi and Hindi reading skills on English reading. However, consistent with studies which advocating the reading processes in different orthographies/cross-linguistically to develop a universal model of reading (Frost, 2012; Perfetti & Harris, 2013; Sadeghi, 2013) the conclusions derived from the work on these three orthographies should be considered in the context of theories and models of reading in general. Similar findings across various orthographies should allow the move towards a universal model of reading.

Over the past 30 years reading researchers have developed models and theories in different fields such as dyslexia, skilled reading and reading development, mainly in English, which is an orthography with many inconsistencies and complexities (Share, 2008; Ziegler et al., 2010). This has led to the demand for research on other orthographies to examine the current model of reading and to develop general theories of reading, which may be considered universal. For this it is necessary to conduct studies on other orthographies than English.

Investigation of the Punjabi and Hindi orthographies are of interest in relation to the demand for a universal model of reading because the orthographies have their own interesting features,

in that these orthographies are alphasyllabic (see Chapter 3 for further details). Similarly, there is paucity of published language research on Hindi and more so Punjabi. Present research reported in this thesis intends to examine the levels of contribution of underlying cognitive-linguistic skills to Punjabi, Hindi and English languages and examine the cross-linguistic influences of Punjabi and Hindi on English reading skills. The skills considered as potential predictors of reading comprehension for investigation in this thesis are: listening comprehension skills, decoding skills, phonological skills, orthographic skills and speed of processing. Both studies (Study 1 and Study 2) in this thesis are designed as cross-sectional, for this approximately 460 trilingual Punjabi speaking participants were recruited from grades 2 to 5, grades 2 and 3 children assumed to be less skilled while grades 4 and 5 children can be considered as relatively experienced readers. The intention here was not to compare between groups but to observe how these levels of explanation might vary across grades (both within the languages and across languages).

Chapter 3

Punjabi and Hindi Languages and Orthographies

3.1 Introduction

The aim of this chapter is to describe the languages and orthographies on which this research was conducted. The data collected in this research was from trilingual children who learned Punjabi as their mother tongue, Hindi as a second language and English as a third language. In this chapter, the Punjabi and Hindi languages and orthographies are the main focus of discussion, because both have alphasyllabic features. A brief outline regarding the Indian languages and language policy in education is also included. At the end of the chapter, a comparative discussion for the three languages is presented.

3.2 The languages in India and language policy in education

In the context of language diversity, India is ranked fourth in the world. Out of 300 to 400 languages belonging to five language families, 22 are acknowledged as official languages in the VIIIth schedule of the Indian Constitution (Hornberger & Vaish, 2009; Koul, 2005; Mohanty Ajit, 2010). Hindi and Punjabi are among these 22 official languages. Hindi and English have been accorded the status of ‘official language’ and ‘co-official language’ by the central government to be used for most administrative purposes. “The Brahmi writing system is one of the world’s ancient script. The akshara at the core of the ancient Brahmi. Many languages of the Indian sub-continent and several languages from South East Asia as well as Central Asia have the Brahmi script as their writing system. Assemse, Bengali, Gujrati, Hindi, Kannada, Malayalam, Punjabi, Tamil and Telugu in India, Sinhala in Sri Lanka, Tibetan in Centarl Asia, Thai, Burese, Khmer, Bugis and Javanese in South East Asia are Examples of languages whose writing system trace their roots back to the Brahmi”(Nag, 2011, p. 291). The symbol units of Hindi and Punjabi writing systems are called akshara. “The askhsra represent the sound at the level of both the phoneme and the syllable

simultaneously giving the writing system its name- alphasyllabary” (Nag, 2014, p. 1). Punjabi is recognised by the Punjab government as the official language of the state of Punjab to be used for most administrative purposes.

The National Commission on Education 1964 - 66 (Hornberger & Vaish, 2009)

recommended a ‘Three language policy’ in education. According to this policy, every state has the right to use its regional language as an official language and as a language of instruction alongside Hindi and English, which are taught as national and co-official languages (Meganathan, 2011). This guiding principle is implemented within Punjab, where education in government primary schools is provided in the regional language (i.e., Punjabi), children also learning Hindi and English as compulsory languages.

3.3 Punjabi Language

‘Punjabi’, also spelled as Panjabi, is the official language of Punjab region of India. It is written in the Gurmukhi script, here Gurmukhi means ‘from the mouth of Guru’. Punjabi is a new Indo-Aryan language spoken in the Punjab states of both India and Pakistan. In Pakistan Sharmukhi script is used for Punjabi language. The Sharmukhi alphabet is a version of Urdu alphabets which are written from right- to-left. There are also large numbers of Punjabi speakers in other countries, such as Canada, the United Kingdom, the United States, Malaysia, South Africa, the United Arab Emirates, New Zealand, and Australia etc. (Koul, 2005). As compared to other modern Indo-Aryan languages, Punjabi has some unique features. First, its lexicon is closely related to the early Vedic Sanskrit. Second, due to Punjab’ proximity to the Middle East and Central Asia and the influence of Islam in the region, it has absorbed a wide range of words and expressions from Arabic and Farsi (Mann,

2011). Finally, Punjabi is the only North Indian language which comprises tones; this linguistic feature has yet to be fully examined (Bhatia, 1993).

Punjabi phonemes are grouped into consonants and vowels. Out of a total of 44 sounds, 32 are consonants, 10 are vowels and 2 are semi vowels. The arrangement of Gurmukhi script is phonetic: the sounds of consonants and semi vowels are classified by the place and manner of articulation (see Table 3.2 for details). Punjabi's 10 basic vowel sounds are presented in Table 3.4. In Punjabi seven types of syllables are acknowledged. (See Table 3.1). The structures of these syllables are CVCC, where C and V represent consonant and vowel. In Punjabi words of more than one syllable are also evident (Parminder Singh & Lehal, 2010).

Table 3.1: Punjabi syllable structure

Sr. No.	Type	Example
1.	V	ਆ (Come)
2.	VC	ਉਹ // (That)
3.	CV	ਗਾ // (sing)
4.	VCC	ਅੱਗ // (Fire)
5.	CVC	ਗੀਤ // (song)
6.	CCVC	ਨ੍ਹਾਤਾ // (bathed)
7.	CVCC	ਕਰਮ // (Action)

(Nigam & Sen, 1975) Note. C= Consonant, V= Vowel

Stress is an important feature of Punjabi, though stress in Punjabi is not fixed, it varies from the initial to final syllable of the word. Stress in monosyllables occurs just at the sentence

level rather than the word level. By contrastively, in polysyllabic words the stress is predictable at the initial and final level (Premparkash Singh, 2010).

3.3.1 Tones

Punjabi is a tonal language, which means that the contours of vocal pitch differentiate the words from each other, although there is no representation of tones within the written script (Gill & Gleason, 1969). Bowden (2012) also reported that, “The Punjabi dialect continuum has clearly been determined to possess tonal features, although it has no genetic connections with other tonal languages, including those are geographically proximate, such as Tibetan and Chinese” (p. 2). This feature of Punjabi was introduced into academic discussion by Bailey (1926) and Das Jain (1926). Even it is not recognized as a tonal language by The World Atlas of Structures online (2012), perhaps due to the many discrepancies found in the existing research. The presence and use of tones within Punjabi oral language is also debated in the field of linguistics. Bowden (2012), conducted an investigation on lexical tone in Punjabi and reported that even linguists are inconsistent to discuss the existence of lexical tone in Punjabi or that tone was not described in detail. There is also disagreement about the number of tones in the language. The difficulty in identifying Punjabi tone patterns linguistically may be because the Punjabi language “does not lean heavily on pitch phonemes” (Malik, 1995) as in the Chinese language. Bowden (2012) concluded that Punjabi includes high and low tones, which relate directly to the classic Gurmukhi orthography, where tonal qualities were represented with aspirated and unaspirated variations of characters. Further research is required to verify the significance of the tones in the Punjabi language.

3.4. Punjabi Orthography

As discussed above, the Punjabi language is written in the Gurmukhi script, which “is derived from Brahmi and is set out in the same arrangement as Devanagari” (Campbell, 2003). The Gurmukhi script is syllabic in nature and written from left to right. It has a phonetic writing system, with one to one mapping of sounds onto aksharas and the new words can be reliably pronounced from their written form (Bhatia, 1993). The characters are usually aligned below the line in writing. A horizontal bar is drawn on the top and the remainder of the akshara is written below. The size of the horizontal bar is longer than the size of letter, to connect its end with the previous and subsequent letter. Punjabi has 35 basic alphabetical symbols. Table 3.2 shows the alphabetical characters used in Punjabi orthography, with their names and sounds in the International Phonetic Alphabet (IPA).

Table 3.2: Shows the alphabet characters used in Punjabi orthography with their names and sounds as in the International Phonetic Alphabet (IPA).

Manner of articulation →	Voiceless Unaspirated		Voiceless Aspirated		Voiced Unaspirated		Voiced Aspirated		Nasals	
Place of articulation ↓	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic
	ੳ	-	ਅ	/ə/	ੲ	-	ਸ	/s/		
	ūrā		ɛrā		īlī		sassā			
Velar	ਕ	/k/	ਖ	/kh/	ਗ	/g/	ਘ	/gh/	ਙ	/ŋ/
	kakkā		khakkhā		gaggā		kāggā		ṅaṅā	
Palatal	ਚ	/j/	ਛ	/jʰ/	ਜ	/dʒ/	ਝ	/dʒʰ/	ਞ	/ɲ/
	ʃaʃjā		ʃʰaʃjʰā		dʒadʒ dʒā		dʒʰadʒdʒ hā		ɲaɲṅā	
Retroflex	ਟ	/ʈ/	ਠ	/ʈʰ/	ਡ	/ɖ/	ਢ	/ɖʰ/	ਣ	/ɳ/
	tattā	ā	tʰattʰā		ɖadɖ ā		ɖʰadɖʰ ā		ṇaṇṇā	
Dental	ਤ	/t̪/	ਥ	/t̪ʰ/	ਦ	/d̪/	ਧ	/d̪ʰ/	ਨ	/n/
	tattā		tʰattʰā		daddā		dʰadddʰā		nannā	
Bilabial	ਪ	/p/	ਫ	/pʰ/	ਬ	/b/	ਭ	/bʰ/	ਮ	/m/
	pappā		pʰappʰā		babbā		bʰabbʰā		mamm ā	
Glottal	ਹ	/h/								
	hahhā									
	ਯ	/j/	ਰ	/r/	ਲ	/l/	ਵ	/v/	ੜ	/ʈ/
	jajjā		rarrā		lallā		vavvā		ṛaṛṛā	

(Bowden, 2012; Mann, 2011)

In the above table the first three characters (ੳ, ਅ, and ੲ) are the vowel carriers. These three characters are unique in Punjabi alphabets because they form the basis for vowels. The independent form of all vowels is always written with the help of vowel carriers. Apart from (ਅ) ɛrā, these characters are never used on their own. See Table 3.4 on vowel signs (*laga*) for further detail.

In Punjabi, there are some borrowed characters, which are those that occur with a small dot at the bottom left of the basic letter form: is called “*per bindi*”, meaning “with a dot underneath” (in Table 3.3). All these characters are used only in adapted loan words from Arabic and Persian languages, mostly from Persian.

Table 3.3: Borrowed alphabets from Arabic and Persian languages

Form	Symbol
ਸ਼	/ʃ/
ਖ਼	/x/
ਗ਼	/ɣ/
ਜ਼	/z/
ਫ਼	/f/
ਲ਼	/l/

The system for vowel representation is less straightforward than that for consonants as the writing system is an *abugida*, where vowel representation is necessary, but secondary. All 10 vowels in Punjabi may be oral or nasalized. Vowels other than schwa /ə/ appear in both independent and dependent forms. The independent forms of the vowels are always written with one of the three consonants of the Punjabi alphabet (see Table 3.2) i.e. ਊ /ūṛā/, ਋ /ṛā/, and ਏ /ēṛā/. These characters are only for representation of independent vowel forms and never used as consonants, with the exception of ਋ /ṛā/. That is why these three characters are known as vowel carriers. The dependent forms of vowels are written in a non-linear

configuration, above, below or to the left or right of the consonant signs (see Table 3.4), and these are also known as diacritic marks.

Table 3.4: The Gurmukhi vowels (both Independent and dependent form)

Sr.No.	Independent form	IPA	Dependent form(Laga matra)	Example with letter ਕ /k/
1.	ਅ/ə/	/ə/	No sign (schwa)	ਕ /kə/
2.	ਆ/a/	/a/	ਾ	ਕਾ /ka /
3.	ਇ/i/	/i/	ਿ	ਕਿ /ki/
4.	ਈ/i/	/i/	ੀ	ਕੀ /ki /
5.	ਉ/u/	/u/	ੁ	ਕੁ /ku/
6.	ਊ/u/	/u/	ੂ	ਕੂ /ku /
7.	ਏ/e/	/e/	ੇ	ਕੇ /ke/
8.	ਐ/ε/	/ε/	ੈ	ਕੈ /kε/
9.	ਓ/o/	/o/	ੋ	ਕੋ /ko/
10.	ਔ/au/	/au/	ੌ	ਕੌ /kau/

(Bowden, 2012)

In Gurmukhi script, ਯ /j/ and ਵ /v/ are considered as semi vowels in Punjabi. For nasalization and gemination (double sound of a consonant), Gurmukhi includes three symbols: /ੰ/ *tippi*, and *bindi* /ਂ/ for nasalization, and *addhak* /ੱ/ for gemination. The *tippi* and *bindi* both

represent the same sound: the usage of both has been determined by orthographic conventions.

E.g., in the word ਕੰਨ /kənn/, which means ear, a small symbol /ੰ/ (*tippi*) on the consonant ਕ /k/ denotes the combination of the nasal sound with the consonant ਨ /n/.

Bindi/ੰ/: is used with *kanna* (ਂ), *bihari* (ੀਂ) or the independent forms of *onkar* (ੴ),

dulankar (ਦੁਲਾਂਕਰ), *lavan* (ਲਵਾਂ), *dulanvan* (ਦੁਲਾਂਵਾਂ), *hora* (ਹੋਰਾਂ) and *kanora* (ਕਾਂਨੋਰਾਂ). For example, in the word

ਬਾਂਹ /banh/, which means arm, the small dot (ੰ) on the vowel sign *kanna* (ਂ) represents that nasalisation of the sound.

Addhak /ੱ/ is used to double the length of consonant sounds. For example, in the word ਨੱਕ /nəkk/ which means nose, a symbol on the top of consonant ਨ /n/ is used for the double length and sound (gemmination) of consonant ਕ /k/.

In Gurmukhi script, most of the clusters are bi-consonants, and these consonant clusters appear in the final and medial position of the words. Punjabi has phonotactic constraints, meaning that there are no consonant clusters in the initial position in a syllable/words except for a few loan words from Sanskrit language (ਯੁੱਤ) and three consonants ਫ਼/h/, ਫ਼/r/, and ਵ਼ /v/, which construct the conjuncts when they adjoin with another consonant. While appearing

as conjuncts, their orthographic form has changed. In Punjabi, only consonant conjuncts are formed the word-initial consonant clusters.

Table 3.5: Consonant clusters in Punjabi language

Word-initial consonant clusters (with conjunct consonants)			
h	ਨ੍ਹਾਤਾ	nhata	bathed
r	ਪ੍ਰਕਾਸ਼	prkaʃ	rise
ʋ	ਸ੍ਵਰਗ	svərg	heaven
Word-medial consonant clusters			
ੜੜ	ਮਜਦੂਰ	mɟʒd̪ur	workman
ਨ੍ਰ	ਸ਼ਾਂਤੀ	ʃant̪i	peace
Word-final consonant clusters			
ਲ੍ਰ	ਹਾਲਤ	hal̪t̪	well
lk	ਪਲਕ	pəl̪k	a moment

3.5. Hindi Language

The Hindi language is an Indo-Aryan language, spoken in the vast areas of north India. It is the official language of India and eleven state governments, including Delhi. Hindi is taught as a second language in all non-Hindi states under the three-language policy (already discussed in subsection 3.2 of this chapter). It is also taught as a foreign language and spoken by immigrants in a large number of countries all over the world (Koul, 2009). Hindi is written

in the Devanagari script, which is used for writing Sanskrit and other Indian languages. The meaning of Devanagari is “divine abode”.

Like Punjabi, Hindi phonemes are also grouped into consonants and vowels. The arrangement of Devanagari is strictly phonetic: the sounds are classified by place of articulation (see Table 3.6 for detail). Hindi consists of a total of 46 sounds (10 vocalic and 36 consonantal), although the number may range from 46 to 47 or even 52 sounds, depending on social and linguistic perspective (Agnihotri, 2007). The arrangement of Devanagari is phonetic (like Punjabi): the sounds of consonants and semi vowels are classified by the place and manner of articulation (see the Table 3.7 for details). Hindi’s 10 basic vowel sounds are presented in Table 3.9.

In Hindi, there are nine types of syllable pattern (See Table 3.6). Most words are two to three syllables in length, but can be up to five syllables.

Table 3.6: Hindi syllable patterns

Sr. No.	Type	Example
1.	V	आ (Come)
2.	VC	आस (Hope)
3.	CV	गा (Sing)
4.	CVC	पूछ (Fire)
5.	VCC(C)	अमृत (Nectar)
6.	CCVC	प्रेम (Love)
7.	CVCC(C)	गुप्त (Secret)
8.	CCV	क्या (What)
9.	CCVCC(C)	स्वप्न (Dream)

(Nigam & Sen, 1975) Note. C = Consonant, V = Vowel

In Hindi, stress is mainly at syllable level. However, stress is not distinctive in Hindi because stress on the first syllable or on the second does not affect the meaning and the quality of the vowel pronunciation will also remain the same (Bhatia, 2008). In general, the first and second syllables are stressed; in words of more than three syllables, the stress is always on the penultimate (second last) syllable (Agnihotri, 2007; Koul, 2009). In Hindi, stress is also used to put emphasis on the particular constituent in a sentence (Nigam & Sen, 1975).

3.6. Hindi Orthography

As discussed earlier, the writing system of Hindi is called Devanagari, in which the characters are classified by place of articulation. (See Table 3.6 for detail). The basic written unit in the script is akshara, which is either a vowel in full form or a consonant with an inherited vowel or vowel diacritic. Hence, every akshara is a syllable, which can be broken into basic phonemes. This unusual mixture of alphabetic and syllabic features makes Hindi an alphasyllabic language. It is a highly phonetic writing system, with one to one mapping of sounds onto - aksharas, and the pronunciation of (new) words can be reliably predicted from their written form. There is no upper-case and lower-case distinction. The characters are written below the line and a horizontal bar drawn on the top of the aksharas. This bar helps to discriminate the word boundaries. The nature of Hindi writing is nonlinear (see the description of vowels for detail) (Gupta & Jamal, 2007; Vaid & Gupta, 2002).

Table 3.7: The alphabet characters used in Hindi orthography with their names and sounds as in the International Phonetic Alphabet (IPA)

Manner of articulation →	Voiceless Unaspirated		Voiceless Aspirated		Voiced Unaspirated		Voiced Aspirated		Nasals		
Place of articulation ↓	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic	Form & Name	Phonetic	Semi vowels
Velar	क /kə/	/k/	ख /khə/	/kh/	ग /gə/	/g/	घ /gʰə/	/gʰ/	ङ /ŋə/	/ŋ/	
Palatal	च /tʃə/	/tʃ/	छ /tʃʰə/	/tʃʰ/	ज /dʒə/	/dʒ/	झ /dʒʰə/	/dʒʰ/	ञ /ɟə/	/ɟ/	य /jə/
Retroflex	ट /ʈə/	/ʈ/	ठ /ʈʰə/	/ʈʰ/	ड /ɖə/	/ɖ/	ढ /ɖʰə/	/ɖʰ/	ण /ɳə/	/ɳ/	र /rə/
Dental	त /tə/	/t̪/	थ /tʰə/	/tʰ̪/	द /d̪ə/	/d̪/	ध /dʱ̪ə/	/dʱ̪/	न /nə/	/n/	ल /l̪ə/
Bilabial	प /pə/	/p/	फ /pʰə/	/pʰ/	ब /bə/	/b/	भ /bʱə/	/bʱ/	म /mə/	/m/	व /və/
Glottal	ह /hə/	/h/									
Sibilants	स /sə/	/s/	श /ʃə/	/ʃ/	ष /ʂə/	/ʂ/					
Ligatures	क्ष /kʃə/	/kʃ/	त्र /t̪rə/	/t̪r/	ज्ञ /g̪jə/	/g̪j/					

Along with the consonants given in table 3.5 Hindi has some loan characters from

Arabic/Persian languages. The following basic alphabets affixed by a dot below and are the borrowed alphabets presented in Table 3.8.

Table 3.8: Borrowed alphabets from Arabic and Persian languages

Name	Symbol	form
क़	/q/	/qə/
ख़	/x/	/xə/
ग़	/ɣ/	/ɣə/
ज़	/z/	/zə/
फ़	/f/	/fə/
ड़	/ɽ/	/ɽə/
ढ़	/rh/	/rhə/

Like Punjabi, most vowels in Hindi have independent and dependent forms. Schwa is the only vowel with no dependent form. The independent form of vowels is written from left to right, but the dependent form of vowels are placed non-linearly on the sides, above or below the consonants as diacritical marks (In Hindi these diacritic marks are known as *matra*) and may be oral and nasalized.

Table 3.9: The Devanagari vowels (both Independent and dependent form)

Sr.No.	Independent form	IPA	Dependent form(Matras)	Example with letter /k/
1.	अ	/ə/	No sign (schwa)	क /kə/
2.	आ	/a/	ा	का /kā /
3.	इ	/ɪ/	ि	कि /kɪ /
4.	ई	/i/	ी	की /ki /
5.	उ	/ʊ/	ु	कु /kʊ /
6.	ऊ	/u/	ू	कू /ku/
7.	ए	/e/	े	के /ke/
8.	ऐ	/ɛ/	ै	कै /kɛ /
9.	ओ	/o/	ो	को /ko/
10.	औ	/aʊ/	ौ	कौ /kaʊ /

य ,ल,र ,and व are semi vowels in Hindi.

Like Punjabi, Hindi also has two symbols that are used to indicate nasalisation:

Bindi/anuswra and *ardhchandra* (or *chanderbindu*)/*anunasika* (Gill & Gleason, 1969; Nigam & Sen, 1975).

Bindi / ं /: A dot above the consonant is called *bindi* (or *anuswra*), representing the nasal

combination with the subsequent consonant. For example, in the word हंस /həns/ (meaning

swan), a small dot on the consonant ह /hə/ indicates the nasal combination with the consonant

स् /s/

Ardhachandra or *chanderbindu* /ँ /: A dot in the shape of a half moon is an *anunasika* (nasal) sign, which denotes the nasalization of the vowel. For example, in the word चँद /tʃand/ (meaning moon), a symbol above the vowel sign /a/ denotes the nasalised version of the vowel. Unlike Punjabi, Hindi does not have any sign for gemination (double sound) or for the long and lengthy sound of any consonants. In Hindi, gemination (doubled sound of the same consonant) is written by dropping the vertical bar of the first consonant and unaltered full symbol for the second consonant, e.g. पक्की) pākki means strong and other consonant conjuncts are used in the same way, but the consonants are different. The conjuncts with र /rə/ are different and need special attention (Bhatia, 2008).

Hindi has word-initial, medial and final forms of consonant clusters. Word-initial and final consonant clusters are not as common as word-medial consonant clusters. The formation of medial consonant clusters is limited within the syllables or morpheme boundaries and by some restrictions. First, two aspirated consonants are not combined together to form a consonant cluster. Second, the consonant /tʰə/ is not used within any consonant clusters. Third, /də/ never occurs as the second member of a consonant cluster.

Table 3.10: Examples of Hindi consonant cluster

Word-initial consonant cluster			
kr	क्रम	kram	order
ty	त्याग	Tya:g	sacrifice
Word-medial consonant cluster			
pt	कप्तान	kapta:n	captain
krm	कर्मचारी	krmca:ri	employee
ndrv	पंद्रहवा	pandhrva:	fifteenth
Word-final consonant cluster			
pp	गप्प	gapp	gossip
ntr	मंत्र	mantr	chant

Like Punjabi, in Hindi character and pronunciation is regular with some irregularities. There is debate over some aspects of phonology and orthography.

3.7 Status of Shwa /ə/ in both Punjabi and Hindi

Schwa /ə/ is an initial vowel: an intervening vowel and associated with every consonant (in articulation only, but not written) of Punjabi and Hindi. It appears in between any two consonants that do not form a cluster and are not separated by any other vowel. Usually the pattern of consonants and vowels predicts the occurrence of schwa /ə/, but generally, initial consonants are always followed by schwa /ə/, if no other vowel is present. Schwa /ə/ never occurs at the end of the word. The smallest unit of Punjabi and Hindi speech is not just a

single phoneme: it is the combination of at least one grapheme and one vowel sound (maybe a dependent form of a vowel, or, if not, then schwa /ə/ is always there). So, the primary mapping of phonology in Punjabi and Hindi is at the level of the orthographic syllable, but the symbols of the language also represent phoneme markers. This unique feature marks out both Punjabi and Hindi as alphasyllabic languages.

3.8 Punjabi, Hindi and English (Differences and Similarities)

Punjabi is the official language and language of instruction in Punjab, a state in north of India. Hindi is the national language of India and the second official language in Punjab. English is considered the co-official language for administrative purposes and taught as a compulsory subject in the schools. In Punjab, under the 'three language policy', the education in government primary schools is in the regional language (Punjabi) and children learn Hindi and English as compulsory additional languages. All participants in this study are from primary schools of from a district of Punjab, so all participants learn Punjabi as their mother tongue, and they learn Hindi and English as their compulsory languages. Even though Punjabi is their mother tongue but they all started to learn to read and write all three languages formally from initial stage of their formal education.

The Punjabi, Hindi and English languages belong to the same subgroup of the Indo-European family. Punjabi and Hindi orthographies are derived from Brahmi, originating from Sanskrit, and they have alphasyllabic features (Masica, 1993) while English has alphabetic orthography, based on Roman script (Daniels & Bright, 1996). Therefore, Hindi and Punjabi are closely related languages. Hindi and Punjabi are written in the Devanagari and Gurmukhi scripts, but English is different from Punjabi and Hindi. The Gurmukhi script, which developed from the Sharada script, has 32 symbols for consonants, 10 for vowel (*Laga*), two for nasal sounds (*Bindi and Tippi*) and one symbol (*Addak*) which is used to indicate

geminates. Devanagari consists of 36 symbols for consonants, 10 for vowels (*Matra*) and 2 symbols for nasal sounds. English has 26 symbols for consonants and 5 symbols for vowels. Unlike Punjabi and Hindi, the English language does not have special symbols to represent nasalization.

Characters in all three languages are used to represent phonemes, with characters being classified by place of articulation, and written and read from left to right. Unlike English, Punjabi and Hindi have a horizontal bar to link the characters of a word, which may aid in perceptual discrimination of word boundaries and upper and lower-case distinctions. Use of schwa in both Punjabi and Hindi differentiates both languages from English. In Hindi, consonant clusters and double consonant sounds (gemination) are written either by forming ligatures involving a half consonant attached to a full one or by adding a special sign to indicate the absence of schwa. The same procedure is followed in Punjabi, but it does not involve usage of half consonants attached to full consonants in the absence of schwa, and for double sound (gemination), the rule is to use a symbol known as '*addak*'. In contrast, English has rules for consonant clusters, but there is no rule or symbol for double sounds or use of half consonants.

Vowel length is phonemic in both languages and both possess two different forms for each of the vowels: independent and dependent forms. In Hindi, the independent form is employed for a vowel that does not immediately follow a consonant or consonant cluster, as in word-initial position, or when it is the second of a sequence of vowels. In Punjabi, when a vowel is not preceded by a consonant, it is written with one of the three vowel bearers: consonant-like signs *ਓ*, *ਅ*, *ਏ*, indicating the absence of a consonant. The use of the dependent form (or *matra*) is non-linear in both languages, consisting of lines, hooks or combinations of both

placed above, below or to the left or right of the consonants. There is no dependent form of vowels in English language.

Punjabi and Hindi orthographies are relatively shallow systems, where the aksharas to sound correspondence is mostly consistent (Daniels & Bright, 1996). In contrast English orthography is opaque: the letter to sound correspondence is not consistent (e.g. *said* vs *paid*, *have* vs *cave*) (Pasquarella, Chen, Gottardo, & Geva, 2015; Share, 2008). Punjabi and Hindi are closely related languages. The writing systems of both are similar but there are some interesting and significant differences. These are not simply in the form of the aksharas, but in the structure of the writing system. The most notable differences are those in the writing of initial vowels, geminate clusters, other clusters, and use of tones (in speaking). In terms of reading, there is a relative one to one grapheme-phoneme correspondence (GPC) in Hindi and Punjabi orthographies. Even though the grapheme-phoneme correspondence is one to one, Punjabi and Hindi have some irregularities and children take several years to learn the *akshara* symbols. However, many researchers consider Punjabi (Bhatia, 1993) and Hindi (Pandey, 2007) as relatively shallow orthographies in contrast to English, which is polyphonic, since graphemes can represent more than one phoneme, and polygraphemic, because it includes some phonemes that can be represented by different graphemes: for example, in English, the letter “a” maps onto a different phoneme in the words *hand*, *hall*, *hate*. In addition, English features many words whose spelling does not convey their pronunciation clearly, and has numerous exceptions and many irregular words (Gupta & Jamal, 2007).

Chapter 4

Developing Measures

4.1 Introduction

The present chapter describes development of each measure in detail along with its rationale of use and inclusion in the assessment battery. The information included in this chapter also a point of reference for each measure that discussed within this whole thesis in further chapters. The detail of the whole assessment battery can be viewed in the Appendices.

The assessment battery of the current study consisting of 10 subtests was developed to investigate the predictors of reading comprehension in English, Hindi and Punjabi. It was also of great interest to investigate the cross-linguistic influence of Punjabi/Hindi to English reading comprehension skills among multilingual children who learn English as an additional language. In this assessment battery, English measures were modified from existing tests based on previous research, but Punjabi and Hindi measures were developed from the text books recommended by the Punjab School Education Board (PSEB), using teacher made tests and on the basis of the developed English measures; the reason being the lack of developed measures in Punjabi and Hindi required for the present study. The relevant literature is reviewed to develop appropriate measures for pilot work. The measures were assessed by five teachers in Punjab who had a minimum experience of five to ten years in language and literacy fields. Prior to the formal administration for the main study, the whole assessment battery was piloted with a small group of children (10 students from Grade from 2 to 5). The pilot work provided practice for the researcher and examined the appropriateness of the tests to address the objectives of the research.

The present study centred on ascertaining the level of skill of trilingual primary school children by using selected measures based on the simple view of reading (Gough & Tunmer,

1986) as discussed in Chapter Two (Literature Review). Hence the tests within the battery measured reading comprehension, listening comprehension, decoding, phonological processing skills, orthographic awareness and speed of processing in Punjabi, Hindi and English. Table 4.1 provides a brief description of the subtests of the assessment battery used in the present research.

Table 4.1: Description of subtests of the developed measures

Reading Comprehension	Passage Reading (Multiple Questions)
Linguistic Competence	Listening Comprehension
Decoding Skills	Pseudo/Non-word reading
Phonological Processing Skills	Deletion Task Substitution Task
Orthographic Awareness Skills	Matching Words Matching Non-words Word Chain Word Sentence
Speed of Processing	RAN Objects

4.2. General procedure of administration

The whole assessment battery was administered in two sessions: one group and one individual session. Group testing was done in the normal classrooms by three trained research assistants: two had experience of teaching young children and one had experience of collecting data for research projects. All research assistants were trained prior to testing. The classroom set up was arranged with one student at one desk and children were not allowed to talk and see each other's sheets. In individual sessions, the children were tested by the

researcher one by one in a quiet room, to avoid the distractions within the school. The record sheets were used to code the answers, and approximately 25 percent of oral measures were audio recorded. Each session took around 55 minutes (including short breaks) and, to avoid fatigue, the data collection procedure was performed over several days (approximately for more than 6 months). Good practice trials were given before administration of each test, to understand the requirement of task. All measures were conducted in such a way that administration of one measure should allow understanding of subsequent measures.

In individual sessions, the measure of Deletion, Substitution, Non-word Reading and Rapid Naming of Objects were administrated. On the other hand, the measures of Reading Comprehension (passage questions), Listening Comprehension, Matching Words and Non-words and Word and Sentence Chain were administrated in the group session. Further explanation on each measure was given as below. In this chapter, only one example was given in each language: English, Punjabi and Hindi (see Appendix A, B and C for further detail).

4.3 Procedure for development of assessment battery

4.3.1 Reading Comprehension

In order to measure Punjabi, Hindi and English text reading ability of primary school students from Punjab, India in all three languages, participants were presented with measures of reading comprehension passage. This measure was developed in all three languages: Punjabi, Hindi and English.

Reading Comprehension Questions

This sub-test contained four passages and 26 multiple choice questions. The passages were designed to increase in length and grade level; participants were required to read these quietly to them. After each passage, the participants answered a series of multiple-choice questions about the passage. Multiple choice questions were developed for each passage that asked for details or inferences about the passages. Each question was followed by one correct response and three distracters and the participants had to choose one of these responses. There was no time limit for grade 5 participants to complete this measure but, to avoid monotony among lower grade participants, a time limit of 15 minutes was fixed. This time limit was based on the time spend by grade 5 participants in pilot study. This time limit did not affect their unlimited access to text while answering the comprehension questions. After 15 minutes, the answer sheets were collected and the number of correct responses out of 26 was used as the achievement score for this test.

While developing this measure in three languages the main challenge was of difficulty level of all three measures to get the variability in scores. The second issue was to increase the difficulty level of passages as the grade level increases. To meet these challenges: a standardized measure Neale Analyses of Reading Ability (NARA) in English language was slightly modified to get fit this it in the Indian context. For Punjabi and Hindi due to non-availability of appropriate standardized measure, the text books of Punjabi School Education Board and teacher made tests and the structure of NARA were used as model to develop this measure. Examples of these measures in Punjabi, Hindi and English are as follows:

Punjabi

ਇਕ ਕਾਲੀ ਬਿੱਲੀ ਮੇਰੇ ਘਰ ਆਈ। ਉਹਨੇ ਅਪਣਾ ਬਲੁੰਗੜਾ ਦਰਵਾਜ਼ੇ ਤੋਂ ਰਖ ਦਿਤਾ। ਫਿਰ ਉਹ ਚਲੀ ਗਈ। ਹੁਣ ਉਹਦਾ ਬੱਚਾ ਮੇਰਾ ਪਾਲਤੂ ਹੈ।

ਬਿੱਲੀ ਕਿਸ ਰੰਗ ਦੀ ਸੀ?

ਕ. ਭੂਰੇ

ਖ. ਪੀਲੇ

ਗ. ਚਿੱਟੇ

ਘ. ਕਾਲੇ

Hindi

एक काली बिल्ली मेरे घर आई। उसने अपना बच्चा दरवाजे से रख दिया। फिर वह चली गई। अब उसका बच्चा मेरा पालतू है।

बिल्ली किस रंग की थी?

क. भूरे

ख. पीले

ग. सफेद

घ. काले

English

A black cat came to my house. She put her kitten by the door. Then she went away. Now I have her baby for a pet.

What colour was the cat?

a. brown

b. yellow

c. white

d. black

4.3.2 Listening Comprehension

To assess the oral language skills of participants three listening comprehension measures, one for each language were developed. In each case the development procedure was similar to the reading comprehension measure, outlined above. However, this measure contained 6 passages with a total number of 39 yes/no (referential and inferential) comprehension questions. These passages were designed to increase in length and difficulty level as according to the increase in grade levels. Participants did not see the content of the passages.

Each passage was articulated in an accent familiar to the participants and they were required to listen to each passage carefully and to tick their yes/no answers (relating to the content) in the boxes provided on their answer sheet.

To avoid confusion or chances of ticking the answers from the wrong passage, every passage was given a sequence number, title and a coloured picture related to the main theme at the starting. The pictures in particular helped lower grade participants to tick answers from the right passage: this made this group administration very easy and chances to tick answers from the wrong passage were reduced to the relevant extent. To avoid the chances of error in ticking the yes/ no boxes, both boxes were of different patterns. Answer sheets were collected after the test and the number of correct responses out of 39 was used as score for this measure.

It is believed that there was no standardized test of verbal ability available in Punjabi, Hindi and English in India, especially to assess primary children. Many standardized measures for this age group were available for English language in the literature, but these are for monolingual children, so to meet the requirement of multilingual children in the present research, the measure in the English language was modified by using the Clinical Evaluation of Language Fundamentals-Fourth Edition (CELF4; Semel, Wiig, & Secord, 2006). Measures in Punjabi and Hindi were developed from the text books recommended by the Punjabi School Education Board curriculum, and from the teacher made tests. The examples in all three languages are as follows:

Punjabi

ਰਾਮ ਨੇ ਇਕ ਪਤੰਗ ਬਣਾਈ। ਸ਼ਾਮ ਵੀ ਇਕ ਪਤੰਗ ਬਣਾਉਣਾ ਚਾਹੁੰਦਾ ਸੀ। ਰਾਮ ਨੇ ਓਹਨੂੰ ਦਸਿਆ ਕੇ ਇਹ ਕਿਵੇਂ ਬਣਾਉਂਦੇ ਨੇ। ਜਦ ਓਹਨਾਂ ਨੇ ਇਹ ਬਣਾ ਲਈਆਂ, ਤਾਂ ਦੋਵੇਂ ਆਪਣੀਆਂ ਪਤੰਗਾਂ ਉਡਾਉਣ ਲਈ ਪਹਾੜੀ ਤੇ ਚਲੇ ਗਏ।

- 1 ਕੀ ਸ਼ਾਮ ਨੇ ਪਤੰਗ ਬਣਾ ਲਈ ਸੀ ?
- 2 ਕੀ ਰਾਮ ਨੇ ਸ਼ਾਮ ਨੂੰ ਪਤੰਗ ਬਣਾਨੀ ਸਿਖਾਈ ਸੀ ?

3 ਕੀ ਦੋਵੇਂ ਪਤੰਗ ਉਡਾਉਣ ਲਈ ਇਮਾਰਤ ਦੀ ਛੱਤ ਤੇ ਚਲੇ ਗਏ ਸੀ ?

ਜਵਾਬ ਸ਼ੀਟ



ਪਤੰਗ

ਹਾਂ

ਨਹੀਂ

1)

☐
☐

2)

☐
☐

3)

☐
☐

Hindi

राम ने एक पतंग बनाई। शाम भी एक पतंग बनाना चाहता था। तब राम ने शाम को दिखाया कि, इसे कैसे बनाते हैं। जब उन्होंने बना लिया, तब अपनी पतंगें उड़ाने के लिये पहाड़ी पर चले गये।

- 1 क्या शाम ने पतंग बना ली थी?
- 2 क्या राम ने शाम को पतंग बनाई सिखायी थी?
- 3 क्या उन्होंने ने एक पतंगें इमारत के शीर्ष पर उड़ाई?

उत्तर पत्रिका



पतंग

हाँ

नहीं

1)

☐
☐

2)

☐
☐

3)

☐
☐

English

Ram made a kite. Sham wanted to make a kite, too. So Ram showed Sham how to make a kite. When they were done, they went up the hill to fly their kites.







- 1 Did Sham make the kite?
- 2 Did Ram teach Sham how to make a kite?
- 3 Did they fly their kites on top of a building?

Answer Sheet



Kite

Yes NO

- | | | |
|----|---|---|
| 1) |  |  |
| 2) |  |  |
| 3) |  |  |

4.3.3 Decoding (Pseudo-word Reading)

Pseudo word reading was used to assess the ability to read letter strings or to decode a pseudo-word. Pseudo-words are pronounceable following the Grapheme-Phoneme correspondence rules of relevant orthography, but they do not have meanings in the given language. Thirty pseudo-words were developed for each measure in Punjabi, Hindi and English languages. For the English version, non-words were derived from the *Woodcock-Johnson III Tests of cognitive Abilities* (Woodcock, McGrew, Mather, & Schrank, 2001). For the Hindi version, the words were taken from elementary books of the Punjab School Education Board and measures used by Gupta (2004) and Gupta & Jamal (2007) for bilingual children. For the Punjabi version, elementary books recommended by the Punjab School Education Board and the pattern of Hindi version were used as a base. All items were arranged in terms of number of syllables per item: pseudo-words of one, two, three or more syllables were included. Since monosyllabic words seem to be rare in Hindi (Koul, 2009) and Punjabi, the pseudo-words used in these measures were of two syllable or more. All 30 items were presented on A4 size paper, printed in bold font. A stopwatch was used to record the time spent by each participant on this task. Participants were told that they would be given some made-up words and they should try to pronounce them correctly for the examiner. The total correctly read items out of 30 were taken as each child's total score. Examples of this measure in Punjabi, Hindi and English are shown below:

1. Punjabi: ਟਰ (as in ਘਰ); ਤਮਲ (as in ਕਮਲ); ਜਵੇਰਾ (as in ਸਵੇਰਾ)

2. Hindi: टर(as in घर); तमल(as in कमल); नवेरा(as in सवेरा)
3. English: gat (as in cat); bupper (as in butter); catavap (as in caravan)

4.3.4 Phonological Awareness Skills

To measure phonological awareness skills of the sample participating in this research, measures of deletion and substitution were structured on those developed in English (Wagner, Torgesen, & Rashotte, 1999; Woodcock et al., 2001) and in Persian-English for bilingual children (Sadeghi, 2013; Sadeghi, Everatt, McNeill, & Rezaei, 2014). These measures are briefly described below.

1. Deletion

Deletion tasks aiming at investigation into the child's ability to recognize a deleted phoneme from a word will be developed. In this task 15 items were presented, each varied in their level of difficulty by increasing the number of phonemes per word. The task is to delete a given sound in a word and give the remaining sound of the word. These phonemes were deleted from the initial, middle or final positions (5 items each). In Punjabi and Hindi this task included the deletion of phonological units: Cə (here C is consonant and ə is schwa), vowels (independent form) and vowel diacritics (dependent form) and consonants. The number of correct responses (out of 15) was used as the final score for this measure. Examples in Punjabi, Hindi and English are given below.

1. Punjabi: Say ਗਮਲਾ /gəməla/ (means flowerpot) without ਆ/a/ sound is ਗਮਲ੍ /gəməl/
2. Hindi: Say बाल्टी/ balti/ (means bucket) without ल्(l) sound is बाटी/ bati/

3. English: Say cup/kʌp/ after deleting the sound of /K/ is /ʌp

2. Substitution

Substitution measures were developed (in Punjabi, Hindi and English) to assess the child's ability to transfer or substitute the sound from one phoneme to another phoneme verbally within a word. English version was modelled on the basis of *Clinical Evaluation of Language Fundamentals-Fourth Edition* (CELF4; Semel, Wiig, & Secord, 2006). The Punjabi and Hindi versions were based on books from the Punjab School Education Board and the same pattern was used in the deletion task: substitution of Cə (here C is consonant and ə is schwa), vowels (independent form) and vowel diacritics (dependent form) and consonants. 15 items were developed with the variation in their level of difficulty increased gradually throughout the test. The phoneme sounds were substituted at initial, medial and final positions of the items (5 trials each). The number of correct responses out of 15 was used as the final score for this measure. Examples in Punjabi, Hindi and English are as follows.

1. Punjabi

Task: Replace the sound of ਢ੍ਰ /r/ in the word ਮਗਰ/məgər/ (means but) by ਜ੍ਰ/dʒ/

Response: ਮਗਜ਼/məgəɖʒ/

2. Hindi

Task: Replace the sound of र् /ma/ in the word मटर/məṭər/, (means peas) by क्/k/

Response: मटक/məṭək/

3. English

Task: Replace the sound of /r/ by /h/ in rope/rəʊp/

Response: hope /həʊp/

4.3.5 Orthographic Skills

Children's knowledge of orthography was assessed via two matching tasks (using words or non-words), and two-word chain tasks (one using random words and the other meaningful sentences). Each of the measures is clarified below.

1. Matching tasks

Two types of matching tasks: matching words and non-words were developed to assess the participants' orthographic skills and knowledge of characters in Punjabi, Hindi and English from text books of the Punjab School Education Board, and words used by other researchers in their research (Gupta & Jamal, 2007; Sadeghi, 2013). Both measures were timed and required the participant to recognize as many as the pairs with same strings of characters in one minute. After one minute, the answer sheets were collected and the final score was calculated by the number of the same pair marked minus the number of incorrect pairs out of 25.

a. Words

50 pairs (25 with the same and 25 with slightly different) of letter strings were presented to the participants, who were asked to find out whether they are the same or different. An example would be the word ਪਿਤਾ (in Punjabi) /pita:/, पिता (in Hindi), meaning father, and the word ਪੀਤਾ (Punjabi) /pita/, पीता (Hindi), meaning drink: both words consist of two consonants and two vowel diacritics, marks, that were similar in shape but different in one vowel diacritic and phoneme (i.e., /i/ in /pita/ and /i:/ in /pi:ta). The same measure was developed in English. The participants were required to underline the matched pairs in one minute (e.g. man: tan kite:kite).

b. Non-words

The same procedure used in the word matching task discussed above was used in modelling the non-word matching measure; however, meaningful words were replaced by 50 pairs (25 with same and 25 with slightly different letter strings) of non-words that can be pronounced in Punjabi, Hindi and English orthographies but have no meaning in the language. The related examples are as follows.

- | | | |
|-------------|-----------------------|----------------|
| 1. Punjabi: | 1. ਫਲੇਰਿਆ: ਫੁਲੇਰਿਆ | 2. ਜਗਰ:ਜਗਰ |
| 2. Hindi: | 1. होयल:हुमल | 2. जमल:जमल |
| 3. English: | 1. <u>boal</u> : boal | 2. floxy:ploxy |

2. Chain Tasks

To assess participants' orthographic knowledge two word chain tasks were developed, which assessed their ability to recognize word boundaries. Both tests were timed and answer sheets were collected after one minute.

a. Random words

Ten trials of 50 randomly selected words with all the characters connected to each other (means space between the words was removed) were developed. It is noteworthy to mention that, in both Punjabi and Hindi orthographies, aksharas within a word are connected to each other by a horizontal bar. However, there are some aksharas in both orthographies, on which the full bar is not used otherwise it changed its meaning: for example, in Punjabi the consonants ਖ/kh/, and ਥ/th/ and in Hindi the consonants घ/g^h/, and ध/d^h/. The child was required to distinguish any meaningful words in the string by drawing a line at the end of each word.

The word chain used in English was the same as used by Sadeghi, A.(2013) . Due consideration was given to the number of syllables used in all three languages for maintaining an equal level of difficulty in all measures (Punjabi, Hindi and English). Examples for this measure are as follows:

Punjabi

ਅਸੀਂ ਅਨੇਕਾ ਥਾਲੀ ਧਰ ਪਰ

ਅਸੀਂ/ਅਨੇਕਾ/ਥਾਲੀ/ਧਰ/ਪਰ

Hindi

गये बाजार किताबें हम घर धरती

गये/बाजार/किताबें/हम/घर/धरती

English

books to am some go

books/i/to/am/some/go

b. Sentences

The same procedures as those utilized in developing random words of word chain tasks were used to develop meaningful sentences with words and letters/aksharas connected to each other. The child was required to distinguish each word in the sentence by drawing a vertical line at the end of each word in the given sentence. Ten sentence trials containing a total of 55 words were developed. After one minute, the answer sheets were collected and the number of words recognized correctly out of 55 was used as the final score for this measure. Examples of such measures in all three languages can be found below.

Punjabi

ਮੈਂ ਕੁਝ ਕਹਾਨਿਆਂ ਪੜ੍ਹਾਂਗਾ

ਮੈਂ/ਕੁਝ/ਕਹਾਨਿਆਂ/ਪੜ੍ਹਾਂਗਾ

Hindi

ਮੈਂ कुछ कहानियां पढ़ूंगा

मैं/कुछ/कहानियां/पढ़ने/जा/रहा/हूँ

English

I will read some stories

I/will/read/ some/stories

4.3.6 Speed of Processing

To assess participants' ability to process information accurately and quickly from their lexicon, one measure Rapid Automatic Naming of Objects was developed in Punjabi, Hindi and English languages and were derived from similar measures in the literature (Denckla & Rudel, 1976; Sadeghi, 2013).

The task measured the speed with which the child can name drawings of familiar objects. A chart containing 50 pictures of objects in five lines (repetition of 10 different objects) was given to participants and they were asked to name them as quickly and as accurately as possible. Prior to administration of this measure the familiarity of 10 objects was checked. A stop watch was used to measure the naming speed in seconds along with the naming errors. The number of errors was small (because participants were familiar with all 10 objects' names), so the time taken by each participant was used as the score for this measure. Figure 4.1 presents the pictures of objects used in this measure.

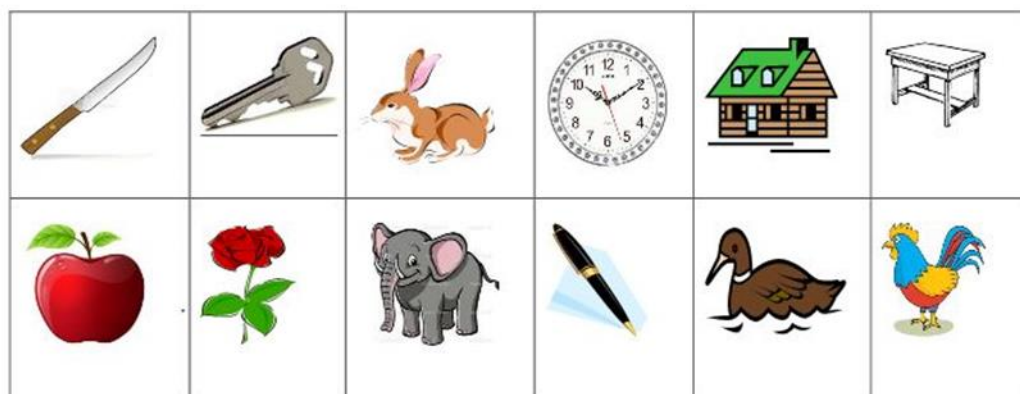


Figure 4.1: Pictures used in the RAN objects

4.4 Piloting

An assessment battery targeting the different key areas of reading comprehension with 10 subtests (see Table 4.1 for details) was piloted among trilingual Punjabi, Hindi and English children in Punjab, India.

4.4.1 Participants: Schools and children

There are different types of schools under the Punjab School Education Board (Go to appendix for further details). The selection criteria were based on the research questions, as the participating schools were expected to teach all the three languages under investigation in the present thesis. The pilot study took place in one school while the data for the main study came from two private schools. These schools followed the Punjab School Education Board's curriculum. These schools charged fees from children and provided no free books, uniforms and meals, and they were managed by the local management with no grant from the state government. All children were from middle and lower middle socio-economic status based on the information collected from schools. School children from Grade 2 to 5 (N= 40, 10 from each grade) were selected from a school affiliated to the Punjabi School Education Board in the Punjab district. Table 4.2 presents the demographic details.

Table 4.2: Demographics information

Grade	2	3	4	5	Total
Gender of child					
Male	5	5	5	5	20
Female	5	5	5	5	20
Mean age (in months)	92	106	121	128	112
Range age (in months)	(84-101)	(92-123)	(96-135)	(109-142)	(84-142)

4.4.2 Procedure

The administration procedure for piloting was similar to the general procedure. The whole assessment battery was administered (by the researcher) in two sessions: one group and one individual session. Group testing was done in the normal classrooms and set up was arranged with one student at one desk and children were not allowed to talk and see each other's sheets. In Individual sessions, the children were tested one by one in a quiet room, to avoid distractions within the school. The record sheets were used to record the answers. To avoid fatigue, the data collection procedure was performed over several days (approximately one month). Good practice trials were given before administration of each test, to understand the requirements of the task.

In individual sessions, the measure of Deletion, Substitution, Non-word Reading and Rapid Naming of Objects were administered. On the other hand, the measures of Reading Comprehension questions, Listening Comprehension, Matching Words and Non-words and Word and Sentence Chain were administered in the group session.

4.4.3 Results

Basic descriptive statistics was undertaken to ascertain whether the measures used in the pilot study were appropriate for a large-scale population. Statistical Package for the Social Sciences (SPSS) software was used to analyse the current data and similarly the whole study data presented in this thesis. Results from the descriptive statistics are presented as below.

4.4.3.1 Descriptive statistics across the grades

Descriptive statistics obtained from the participants across grades are presented in this section, which provides the mean, standard deviation and range of the scores. These results are presented in Tables 4.3 to 4.7 and followed by the discussion on these findings.

Table 4.3: Mean scores and standard deviations for the measures reading comprehension and listening comprehension (from Grades 2 to 5)

		Reading comprehension			Listening comprehension		
Total scores		25			39		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	8.40	11.20	7.40	26.00	23.10	19.70
	SD	5.68	6.43	4.22	6.39	4.15	3.65
	Range	1-19	3-23	0-14	14-35	16-31	12-23
Grade 3	Mean	16.20	16.20	11.70	31.10	26.70	20.80
	SD	4.77	4.77	4.08	5.37	5.62	5.38
	Range	4-20	8-21	6-17	19-36	21-36	16-25
Grade 4	Mean	18.60	15.40	11.90	30.70	28.40	19.40
	SD	4.69	4.72	2.96	3.20	4.27	2.32
	Range	10-25	8-23	6-16	25-36	21-35	16-23
Grade 5	Mean	21.20	22.60	13.10	31.00	29.20	21.30
	SD	1.69	1.65	2.38	3.77	5.39	2.45
	Range	19-24	19-24	9-17	25-37	21-37	16-25

Table 4.4: Mean scores and standard deviations for the phonological measures (deletion and substitution) (from Grades 2 to 5)

		Deletion			substitution		
Total scores		15			15		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	5.70	4.50	3.60	4.70	4.70	4.40
	SD	1.57	1.84	2.91	2.21	2.21	3.43
	Range	3-8	2-8	0-8	1-8	1-8	0-10
Grade 3	Mean	8.40	7.10	8.50	8.20	7.10	9.50
	SD	2.59	3.04	3.17	2.25	2.33	2.32
	Range	4-12	4-12	3-13	4-11	3-10	7-13
Grade 4	Mean	7.20	7.50	7.90	6.90	7.00	8.00
	SD	3.22	3.31	3.69	3.98	3.68	3.50
	Range	2-12	3-12	2-14	1-13	3-15	3-14
Grade 5	Mean	9.00	8.60	8.60	8.30	8.80	9.20
	SD	3.05	2.55	3.06	2.83	2.39	2.78
	Range	5-14	5-12	5-14	5-13	5-11	5-14

Table 4.5: Mean scores and standard deviations for the measures of pseudo-word reading and speed of processing (Grades 2 to 5)

		Pseudo-word reading			Rapid Automatized Naming (objects)		
Total scores		30			Score (Timing, in seconds)		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	11.0	10.40	2.40	45.2(62.6)	44.3(68.3)	37.4(93.8)
	SD	6.83	4.72	1.07	3.46(12.28)	4.22(16.06)	6.13(21.48)
	Range	1-23	3-16	0-4	37-48(43-81)	37-49(41-100)	28-47 (60-120)
Grade 3	Mean	15.40	15.70	6.30	47.6(53.10)	43.6(66.2)	39.0(80.5)
	SD	4.88	5.01	4.50	1.35(5.88)	6.08(8.50)	7.31(18.31)
	Range	8-22	7-24	3-18	45-49(45-61)	32-50(56-78)	27-47(60-120)
Grade 4	Mean	18.80	16.10	4.90	44.1(60.2)	45.3(65.0)	41.5(70.7)
	SD	6.18	8.21	2.81	6.57(10.8)	5.01(18.02)	8.58(18.6)
	Range	11-27	4-27	3-11	30-50(45-80)	35-50(44-110)	27-49(53-103)
Grade 5	Mean	20.60	21.60	8.10	48.8(53.8)	45.7(57.5)	44.6(74.9)
	SD	5.70	4.99	4.61	1.14(9.08)	3.74(16.8)	8.15(19.8)
	Range	10-27	11-28	4-18	47-50(42-74)	38-50(42-83)	23-50(49-119)

Table 4.6: Mean scores and standard deviations for the orthographic measures (word matching and non-word matching) (Grades 2 to 5)

		Word matching			Non-word matching		
Total scores		25			25		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	15.6	13.8	9.50	12.60	13.30	7.70
	SD	5.54	2.90	2.71	2.951	3.683	1.636
	Range	8-24	10-18	7-15	9-19	7-19	4-9
Grade 3	Mean	18.8	16.4	11.9	15.20	15.00	11.40
	SD	1.69	3.03	1.73	3.64	3.46	1.78
	Range	17-23	10-19	9-15	11-22	10-20	9-15
Grade 4	Mean	17.5	16.7	16.4	18.30	17.60	14.80
	SD	4.03	1.63	3.06	2.87	2.76	2.66
	Range	12-25	13-18	10-19	13-23	11-21	11-19
Grade 5	Mean	20.6	19.4	17.7	18.90	19.80	17.20
	SD	3.72	2.59	3.16	3.07	2.25	3.94
	Range	15-25	16-24	14-23	14-23	16-23	11-24

Table 4.7: Mean scores and standard deviations for the orthographic measures (word chain and sentence chain) (Grades 2 to 5)

		Word chain			Sentence chain		
Total scores		50			55		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	18.7	9.40	2.60	7.00	7.50	3.60
	SD	12.5	8.409	3.03	7.07	5.60	3.03
	Range	0-37	2-27	0-9	0-19	0-19	0-8
Grade 3	Mean	26.4	17.70	12.5	13.9	15.0	12.6
	SD	9.20	4.990	5.84	7.38	5.54	3.60
	Range	13-41	9-25	6-25	5-31	8-26	8-20
Grade 4	Mean	34.7	27.00	12.5	14.3	19.6	16.1
	SD	12.6	8.807	4.65	7.87	5.17	5.32
	Range	16-55	11-41	8-21	2-28	9-27	7-23
Grade 5	Mean	42.4	38.60	19.7	22.3	26.4	18.1
	SD	13.1	12.15	7.67	10.7	10.7	5.97
	Range	19-50	17-49	5-29	7-37	13-40	10-27

This pilot study on multilingual children (Grade 2 to 5) was a trial of the whole assessment battery and its administration procedure. It gave a clear vision about the timing and administration of measures in each language. From this pilot study, it was clear that the participants seemed to be academically better than the wider population of the main study. Especially, grade 3 children appeared to be better than grade 4 in some measures. This can be due to the selection of better children in grade 3. Overall, the Mean and Standard Deviation of most measures proved to be satisfactory. Analyses of the pilot data showed that Pseudo-word reading and Orthographic measures (see Tables 4.5 to 4.7 for details) showed an increase in the average scores for higher grades with satisfactory variability and score range. However, analyses from the pilot study presented in Table 4.3 to 4.7, argued for changes in some measures. These will be explained in the next section.

4.4.4 Changes made to the finalised assessment

After reviewing the results obtained from the participants in the pilot study, changes were made to some of the subtests and also in administration timing. Lack of improvement in average scores in the grades was observed in the reading comprehension measure for English and Hindi. The same was evident for the listening comprehension in Punjabi (see Table 4.3). However, the range of scores with maximum and minimum scores showed satisfactory levels of variability for these measures. Hence no changes were made for these measures. However, to avoid monotony among younger children (Grades 2 and 3), the time was reduced to 15 minutes: the timing that seemed suitable for children of grade 5 to complete this task. For the listening comprehension measure, it was decided to increase the pace of articulation to get more variability in scores.

The analyses for the RAN object (see Table 4.4) showed errors in the average score: that is scores reduced in higher grades. The RAN object task was to measure the speed at which

child was required to name drawings of familiar objects with lower number of errors. During the pilot study, it was found that the pilot group was not familiar with some objects. Hence the unknown objects were taken out of the tests and more familiar items included. In phonological measures (see Table 4.4) children performed better in English language than in Punjabi and Hindi, and there is nothing wrong with this result, but it is quite interesting that children performed well in a foreign language rather than their mother tongue (Punjabi). The reason can be the arrangement of words relative to the difficulty level. To enhance the authenticity in the data from the main study, all phonological measures were reviewed and words were rearranged as per according to their increased level of difficulty, and some words were changed after considering the number of syllables to maintain the same level of difficulty in all three languages.

Chapter 5

Study One: Predictors of Reading Comprehension of Punjabi, Hindi and English among Multilingual Children

5.1 Introduction

The assessment of predictors of reading comprehension among multilingual readers has already addressed within the existing literature, but this has typically been limited to the comparison of monolingual and bilingual readers. Most of the models and interpretations related to literacy development have also predominately focused on English language. Though, relationships between literacy learning and underlying cognitive skills have been found across a number of languages, there is still a need to investigate these skills/predictors of reading in a larger range of orthographies. Researchers like Frost (2012) and Sadeghi (2013) have emphasized the development of universal models/interpretations of reading processes across languages, but these theorists also agree for additional research in more orthographies.

Perfetti and Harris(2013) explained the connections among language, writing system and reading that confront a child when learning to read. As per their explanation, the reading processes are generally based on the language universals but also depend on the writing system that encodes the language. In fact, it is argued by many researchers that the difference in writing system (orthography) may have specific influences on reading processes. Learners of shallow orthographies, where each letter (grapheme) corresponds to one sound (phoneme) and vice versa typically progress faster in word-level literacy and language (Goswami, Ziegler, Dalton, & Schneider, 2003). In contrast, readers of deep orthographies, where letter to sound correspondence is not one to one, have shown slower progress on word level literacy and language. Given that the English orthography is relatively deep, the universality of

English language theories can be questioned (Share, 2008). Therefore, research on other orthographies/ languages is needed to validate these theories.

Punjabi, Hindi and English languages belong to the same subgroup of the Indo-European family, but Punjabi and Hindi are descendants of Brahmi, originating from Sanskrit written in Devanagari and Gurmukhi scripts (Masica, 1993). Whereas English is an alphabetic orthography based on the Roman script (Pasquarella et al., 2015). Therefore, Punjabi and Hindi are closely written languages, but both differ from English. Characters in all three languages are used to represent phonetics, with being classified by place of articulation and written and read from left to right. Unlike English, Punjabi and Hindi has a horizontal bar to links the aksharas of a word which may aid in perceptual discrimination of word boundaries. English has upper and lower distinction in writing but Punjabi and Hindi don't have it (Daniels & Bright, 1996; Vaid & Gupta, 2002). Feature of schwa in both Punjabi and Hindi differentiate both languages from English language. Rules of consonant clusters and double sound of the consonant (gemination) also differ in across Punjabi, Hindi and English languages (see chapter 4 for details).

The Punjabi and Hindi writing systems of both are similar with some interesting and significant differences. Not just in the form of the aksharas, but in the structure of the writing system. For example, differences are found in the writing of initial vowels and geminate clusters plus some other clusters. There are also difference in the use of tones in speaking and feature of schwa in both Punjabi and Hindi differentiate both languages from English language.

Given the difference briefly outlined above (and discussed in Chapter 3 of this thesis), the present study set out to investigate the underlying cognitive skills of multilingual readers, who learn Punjabi as their mother tongue and Hindi and English as additional languages. The

study assessed the predictors of Punjabi, Hindi and English reading comprehension through a cross-sectional design which measured skills among the multilingual primary school children (from Grades 2 to 5) attending mainstream schools in Punjab (India). The main concern in this chapter was, whether these predictors are similar across the all three orthographies, in what way they differ.

5.2 Method

5.2.1 Participants

A cohort from two primary schools, from Punjab (India) were assessed on the language and literacy skills that included measures of reading comprehension, listening comprehension, phonological awareness, orthographic knowledge and speed of processing. The cohort selected was obtained from those with similar socioeconomic status, to avoid this factor influencing variability in reading and language skills. In Punjab ‘the multilingual policy’ is used which means that the children learn three languages (see chapter 4 for more detail). Participants were selected from two private schools affiliated to Punjab School Education Board (PSEB), with approximately equal male and female ratio. Schools affiliated to Punjab School Education Board (PSEB) followed the same curriculum and text books. Two to three classes/sections from each grade (2 to 5), approximately 110 children (55 boys and 55 girls) were selected from the participating schools. All available children from these classes were assessed. Overall, 440 children were assessed (see Table 5.1). Punjabi was the first language for all participants. All these children started to learn Punjabi, Hindi and English languages from their initial stage of formal literacy learning, but their mother tongue was Punjabi (based on the teacher interviews, information about the school population and geographical set up of the district from where the data was collected).

Table 5.1: Demographic information- Number of participants (based on male and female), mean and range of age in months as per each grade

Grade	2	3	4	5	Total
Gender of child					
Male	60	58	61	56	235
Female	50	51	50	54	205
Mean age (in months)	91	103	116	128	110
Range age (in months)	(70-105)	(86-121)	(96-135)	(109-142)	(70-142)

Data from 397 children was analysed. Table 5.2 presents the summary of why children were excluded from the present analyses. Reading comprehension was the main key measure of the study, so children (N= 30) who were absent when this measure was administrated excluded from the analyses. Children (N=8) who performed in reading comprehension measure but due to their personal and health reasons, could not come to school regularly or quit the school (and moved to another city) were deselected from the analyses. Finally, children (N=5) with recognized problems were deselected from analyses as they missed too many assessment days. These children included: i) three children with attention problems, who were lower achievers, ii) one child with eyesight problem who couldn't read and write properly even with the glasses and iii) one child had hearing problems who required special attention and assistance for reading and writing.

Table 5.2: Summary of excluded children from analyses

	Frequency	Percent
Total Number of Children tested	440	100
Children absent in reading comprehension measure	30	6.8
Children who quit the study	8	1.8
Children with any difficulty	5	1.1
Total Number of Children analysed	397	90.2

Before starting the data collection for pilot and main study the approval from Educational Research Human Ethics committee of University of Canterbury and from local authorities (management and principals) of participating schools had been taken. Along with it to follow appropriate ethical norms, consent of all participants and their parents had been taken. Three research assistants with experience in educational field were trained to administer the test materials using the same procedure for each participant. Two of these assistants had two to four years' experience with young children. One research assistant just finished her master in education and had experience of field work. The research assistants were trained and given the instructions on the administration of the test material.

5.2.2 Measures

An assessment battery of ten measures in each language (i.e Punjabi, Hindi and English, producing a total of 30 measures) was included in the present study (see details in chapter 4 of this thesis). As discussed previously the use of measures standardised on monolingual English group of students would not be measures were not suitable for multilingual children from Indian context, so these measures were modified. To assess the language skills in

Punjabi and Hindi languages appropriate measures were not available, so these were developed by the researcher. To maintain the appropriate use of language and context, school text books were used as a guideline for selection of passages and other written and verbal material of all tests. All tests were peer reviewed by ten primary teachers from Punjab, to ensure the appropriateness of material for primary children (from Grades 2 to 5). The whole assessment battery was piloted and amended prior to the administration within this study (see chapter 4 for detail). Subtests within the assessment battery were designed to measure levels of reading and listening comprehension, decoding, phonological or orthographic skills and speed of processing at primary level in Punjabi, Hindi and English languages.

Tests were administrated in two sessions: one individual and one group. In individual sessions, children were tested individually in quiet room to avoid distractions. Group sessions occurred in the classroom settings, but children were not allowed to look at each other's work. Before administration of each test, a practice trial was given to all children to understand the requirement of each test. Each session was of approximately 60 minutes including short breaks. The data were collected over several months within one school and a specific order of testing was used to ensure consistent experiencing of measures across children. For individual testing the children were given the measures in the following order: RAN (objects), Pseudo word reading, deletion and substitution. For group testing, the following measures were given in this order: Reading comprehension, listening comprehension, word matching, non-word matching, lexical decision, word chain, sentence chain (see chapter 4 for further details). After collection of data, raw scores were used for the analyses presented in this chapter. Table 5.3 is presents the list of measures (in Punjabi, Hindi and English languages) used in this study.

Table 5.3: List of subtests comprising the whole assessment battery used in present study

Reading comprehension	Passage Reading (Multiple Questions)
Linguistic Competence	Listening Comprehension
Decoding Skills	Pseudo/Non-word reading
Phonological Skills	Deletion Substitution
Orthographic Skills	Matching Words Matching Non-words Word Chain Word Sentence
Speed of Processing	Rapid Automatized Naming (RAN) of objects

5.3 Results

5.3.1 Descriptive statistics across the grades

Descriptive statistics were used to calculate the mean and standard deviation for each grade level; these are presented in the Tables 5.4 to 5.8. Overall, the mean values showed improvement with the growth of age and grade level of all children. The standard deviation scores showed reasonable variability in each measure as per the grade level of the whole cohort. No ceiling effect was found in any measure of the whole assessment battery. For speed of processing measure (RAN-objects) of the study time per second taken by each child for each measure was used to calculate the mean and standard deviation.

Table 5.4: Mean scores and standard deviations for the measures reading comprehension and listening comprehension (from Grades 2 to 5)

		Reading comprehension			Listening comprehension		
Total scores		25			39		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade	Mean	9.92	8.07	5.80	22.85	18.50	13.48
2	SD	3.98	4.43	3.60	5.69	5.06	4.43
Grade	Mean	15.68	12.03	8.36	26.10	22.10	16.04
3	SD	4.77	4.77	4.08	5.37	5.62	5.38
Grade	Mean	18.92	15.59	12.22	28.91	27.00	19.77
4	SD	5.45	5.71	3.62	3.94	4.99	4.90
Grade	Mean	21.78	18.46	13.80	32.62	28.50	21.43
5	SD	4.01	4.07	3.21	3.25	3.72	3.84

Note. SD= Standard Deviation.

Table 5.5: Mean scores and standard deviations for the phonological measures (deletion and substitution) of the study (Grades 2 to 5)

		Deletion			Substitution		
Total scores		15			15		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade	Mean	6.52	4.86	3.64	5.57	4.17	3.23
2	SD	3.32	2.88	2.53	2.72	2.60	2.27
Grade	Mean	7.76	7.16	5.44	7.68	6.28	4.97
3	SD	2.65	2.81	2.52	2.73	2.39	2.61
Grade	Mean	10.08	8.72	7.29	10.44	8.53	6.31
4	SD	2.79	2.97	3.35	2.64	2.76	2.59
Grade	Mean	13.21	11.74	9.48	12.38	11.12	8.74
5	SD	1.50	2.36	2.94	1.95	2.05	2.78

Note. SD= Standard Deviation.

Table 5.6: Mean scores and standard deviations for the measures of pseudo-word reading and speed of processing (Grades 2 to 5)

		Pseudo-word reading			Rapid Automatized Naming (objects)		
Total scores		39			Time in seconds		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	11.56	10.94	6.42	73.37	82.67	105.05
	SD	6.77	6.56	3.94	18.51	24.73	40.44
Grade 3	Mean	15.92	14.31	8.74	62.00	74.17	89.40
	SD	6.65	6.99	5.01	12.55	18.96	31.42
Grade 4	Mean	22.12	19.81	12.96	57.13	63.17	79.90
	SD	4.03	6.27	6.32	12.19	15.22	26.84
Grade 5	Mean	23.73	21.31	15.50	51.84	56.43	75.41
	SD	4.21	5.10	6.13	14.74	12.70	29.22

Note. SD= Standard Deviation.

Table 5.7: Mean scores and standard deviations for the orthographic measures (word matching and non-word matching) of the study (Grades 2 to 5)

		Word matching			Non-word matching		
Total scores		25			25		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade 2	Mean	13.16	10.85	8.24	13.81	12.74	9.84
	SD	4.96	3.99	3.64	3.20	3.75	3.87
Grade 3	Mean	16.61	13.98	11.62	17.79	15.18	11.99
	SD	3.74	3.78	4.62	3.36	3.79	4.04
Grade 4	Mean	20.06	17.63	14.44	20.52	17.98	14.43
	SD	3.95	3.06	3.99	3.64	3.65	3.28
Grade 5	Mean	21.81	19.83	16.28	22.47	20.43	16.70
	SD	3.33	3.36	4.79	2.23	2.97	4.03

Note. SD= Standard Deviation.

Table 5.8: Mean scores and standard deviations for the orthographic measures (word chain and sentence chain) of the study (Grades 2 to 5)

		Word chain			Sentence chain		
Total scores		50			55		
		Punjabi	Hindi	English	Punjabi	Hindi	English
Grade	Mean	11.10	9.17	6.34	17.19	10.87	6.93
2	SD	5.46	4.38	4.56	7.28	5.53	4.32
Grade	Mean	14.93	11.69	9.42	27.41	17.47	10.02
3	SD	7.96	6.34	7.77	9.22	6.98	5.94
Grade	Mean	22.94	19.86	15.87	31.15	24.40	17.66
4	SD	9.22	8.10	7.75	10.99	8.21	8.24
Grade	Mean	26.55	22.07	18.38	35.31	27.03	19.55
5	SD	11.54	9.28	8.77	14.10	11.15	9.67

Note. SD= Standard Deviation.

5.3.2 Correlation between the measures

To assess the relationship between the measure of reading comprehension and other measures of the study in Punjabi, Hindi and English languages, partial correlations (controlling for age in months, Gender and grade) were calculated. The results from the correlation analyses are presented in Tables 5.9 to 5.14.

Relationships were found between similar measures of each language. Reading comprehension measure was significantly correlated with listening comprehension, pseudo word reading, phonology, orthography and speed of processing measures in all three languages. All measures not only significantly correlated with reading comprehension but also showed within and across language relationships. Only one measure of phonology, substitution in Punjabi was not correlated and one of orthography, sentence chain in Punjabi negatively correlated with reading comprehension in English.

Table 5.9: Partial correlation (controlling for age, gender and grade) of reading comprehension and listening comprehension measures of the study

	Reading comprehension			Listening comprehension		
	Punjabi	Hindi	English	Punjabi	Hindi	English
Reading comprehension						
Punjabi	1.000	.692**	.437**	.178**	.167**	.122**
Hindi	.692**	1.000	.588**	.246**	.272**	.191**
English	.437**	.588**	1.000	.237**	.260**	.237**
Listening comprehension						
Punjabi	.178**	.246**	.237**	1.000	.628**	.426**
Hindi	.167**	.272**	.260**	.628**	1.000	.624**
English	.122**	.191**	.237**	.426**	.624**	1.000

*p < .05. **p < .01

Table 5.10: Partial correlation (controlling for age, gender and grade) of reading comprehension and decoding measures of the study

	Reading comprehension			Pseudo word reading		
	Punjabi	Hindi	English	Punjabi	Hindi	English
Pseudo-word reading						
Punjabi	.339**	.395**	.295**	1.000	.668**	.533**
Hindi	.375**	.491**	.380**	.668**	1.000	.571**
English	.344**	.503**	.433**	.533**	.571**	1.000

*p < .05. **p < .01

Table 5.11: Partial correlation (controlling for age, gender and grade) of reading comprehension and phonological measures of the study

	Reading comprehension			Deletion			Substitution		
	Punjabi	Hindi	English	Punjabi	Hindi	English	Punjabi	Hindi	English
Deletion									
Punjabi	.137**	.241**	.129**	1.000	.686**	.439**	.390**	.549**	.497**
Hindi	.277**	.365**	.256**	.686**	1.000	.616**	.408**	.724**	.644**
English	.383**	.430**	.323**	.439**	.616**	1.000	.310**	.520**	.651**
Substitution									
Punjabi	.155**	.239**	.091	.390**	.408**	.310**	1.000	.484**	.361**
Hindi	.263**	.378**	.240**	.549**	.724**	.520**	.484**	1.000	.677**
English	.270**	.389**	.259**	.497**	.644**	.651**	.361**	.677**	1.000

*p < .05. **p < .01

Table 5.12: Partial correlation (controlling for age, gender and grade) of reading comprehension and orthographic (word matching and non-word matching) measures of the study

	Reading Comprehension			Word matching			Non-word matching		
	Punjabi	Hindi	English	Punjabi	Hindi	English	Punjabi	Hindi	English
Word matching									
Punjabi	.256**	.265**	.311**	1.000	.705**	.534**	.410**	.448**	.406**
Hindi	.268**	.302**	.343**	.705**	1.000	.742**	.457**	.571**	.571**
English	.276**	.294**	.359**	.534**	.742**	1.000	.417**	.552**	.579**
Non-word matching									
Punjabi	.229**	.271**	.231**	.410**	.457**	.417**	1.000	.656**	.478**
Hindi	.224**	.257**	.245**	.448**	.571**	.552**	.656**	1.000	.773**
English	.229**	.230**	.289**	.406**	.571**	.579**	.478**	.773**	1.000

*p < .05 **p < .01

Table 5.13: Partial correlation (controlling for age, gender and grade) of reading comprehension and orthographic (Word and sentence chain) measures of the study

	Reading comprehension			Word chain			Sentence chain		
	Punjabi	Hindi	English	Punjabi	Hindi	English	Punjabi	Hindi	English
Word chain									
Punjabi	.262**	.302**	.380**	1.000	.805**	.634**	.175**	.470**	.528**
Hindi	.323**	.400**	.428**	.805**	1.000	.764**	.212**	.560**	.609**
English	.375**	.421**	.455**	.634**	.764**	1.000	.147**	.502**	.606**
Sentence chain									
Punjabi	.137**	.104*	-.046	.175**	.212**	.147**	1.000	.545**	.280**
Hindi	.344**	.392**	.262**	.470**	.560**	.502**	.545**	1.000	.667**
English	.341**	.409**	.394**	.528**	.609**	.606**	.280**	.667**	1.000

*p < .05. **p < .01

Table 5.14: Partial correlation (controlling for age, gender and grade) of reading comprehension and speed of processing measures of the study

	Reading comprehension			RAN (objects)		
	Punjabi language	Hindi language	English language	Punjabi language	Hindi language	English language
RAN objects						
Punjabi Language	-.133**	-.171**	-.118**	1.000	.496**	.358**
Hindi Language	-.209**	-.295**	-.296**	.496**	1.000	.521**
English language	-.288**	-.410**	-.443**	.358**	.521**	1.000

*p < .05. **p < .01

5.3.3 Predictors of reading comprehension in Punjabi, Hindi and English languages

Results from correlation demonstrated strong relationships between reading comprehension measure and the other measures: listening comprehension, decoding, phonological skills, orthographic knowledge and speed of processing. These correlation analyses were followed by hierarchical multiple regression analyses that assessed the ability of each measure to predict reading comprehension in Punjabi, Hindi and English languages. The SVR (Gough & Tunmer, 1986; Hoover & Gough, 1990) was used as a base for theoretical rationale for the

order of entry of variables into the regressions. Measure of reading comprehension (total scores) was used as dependent variable, while the measures of listening comprehension, decoding, phonological processing, orthographic knowledge and speed of processing were used as independent variables. The reading comprehension measure used as dependent variable throughout the regression analyses (for all Punjabi, Hindi and English languages) as it is accepted by many researchers like Nation (2005) and Paris (2009), Sadeghi (2013), that reading comprehension is the ultimate aim of reading.

In order to investigate the trend of predictors from an early stage of reading to relatively experienced readers, the data were analysed based on two groups: younger (Grades 2 and 3) and older (Grades 4 and 5). This allowed comparison of younger and older cohorts and maintained a reasonable sample size in each regression analysis by combining two grades within the grouping variable.

5.3.3.1 Predictors of Punjabi reading comprehension

Hierarchical regression analysis was followed to assess the level of prediction of Punjabi reading comprehension provided by the combination of Punjabi measures in the assessment battery. For these analyses Punjabi reading comprehension was used as the dependent variable. After the controlled variables (age, gender and grade) Punjabi listening comprehension measure was entered to assess influence of understanding on Punjabi reading comprehension followed by Punjabi decoding measure: this is represented by order 1, 2 and 3 in all regression result tables. Next, Punjabi phonological measures (deletion and substitution) were entered followed by the orthographic measures (word and non-word matching, word and sentence chain): this is presented by order A (3 and 4) in the all regression result tables. The order of entry of the phonological and orthographic measures was then reversed: represented by order B (3 and 4) in regression result tables and in order 6 rapid naming

measure was entered as final regression separate from phonological and orthographic measures. Table 5.15 present the results of a hierarchical regression analysis for Punjabi reading comprehension.

Table 5.15: Hierarchical regression analysis to investigate predictors of Punjabi reading comprehension (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.475	.475	F= 118.65 P<.001	Gender Grade Age	-.027 .261** -.055
2	Listening comprehension	.492	.017	F=12.82 P<.001	Listening comprehension	.078*
3	Pseudo-word reading (Decoding)	.542	.050	F=.42.73 P<.001	Pseudo-word Reading (Decoding)	.244**
A4	Phonological processing	.543	.001	F=.617 P=.540	Deletion Substitution	-.039 .048
A5	Orthographic knowledge	.581	.038	F= 8.68 P<.001	Words Matching Non-word Matching Word Chains Sentence Chains	.120** .112** .092* .058
B4	Orthographic knowledge	.580	.038	F=8.794 P<.001		
B5	Phonological processing	.581	.001	F=.494 P=.611		
6	Speed of Processing	.582	.001	F=.1.14 P=.285	RAN Objects	-.041

*p < .05 **p < .01

Results obtained from this analysis revealed that in model 1 (of Table 5.15), from Gender, grade and age, only grade was statistically significant. Model 2 and 3 demonstrates the results of listening comprehension and decoding, which were statistically significant at .05 and 0.01 levels. The next Model A4, presenting the results of phonological processing, was not significant (with a variance of .001% only). On the contrary, the orthographic knowledge with was demonstrated by Model A5, was statistically significant. Model B4 and B5

demonstrate the results when all measures of these two variables of phonological processing and orthographic knowledge were entered in reverse order. The result from both models (B4 and B5) was same as the previous models (A4 and A5). The results from these models showed that the variables of orthographic knowledge share approximately 4% of variance in reading comprehension. Out of four variables of orthographic knowledge three variables (word, non-word matching and word chain task) were statistically significance with Beta weights ($\beta = .120, p < .001$, $\beta = .112, p < .001$ and $\beta = .092, p < .05$). The Model 6 revealed the result of speed of processing and it was not significant.

The results were highly consistent with the simple view of reading. Reading comprehension in Punjabi seems to be predicted by word level and understanding level skills. However orthographic knowledge (in Punjabi) was adding the variability in Punjabi reading comprehension on over and above the word and understanding level skills.

Similar hierarchical regression analyses were conducted focusing on younger and older groups of Punjabi measures. The dependent variable and entry of all independent variables were same. Table 5.16 and Table 5.17 present the results for Punjabi reading comprehension for both groups (younger and older).

Table 5.16: Hierarchical regression analysis to investigate predictors of Punjabi Reading Comprehension of for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.312	.312	F=29.80 P<.001	Gender Grade Age	.002 .174** .126*
2	Listening comprehension	.332	.020	F=5.83 P<.01	Listening comprehension	.050
3	Pseudo-word reading (Decoding)	.448	.116	F=.40.95 P<.001	Pseudo-word reading (Decoding)	.321**
A 4	Phonological processing	.450	.002	F=.393 P=.676	Deletion Substitution	-.012 .007
A 5	Orthographic knowledge	.510	.060	F=5.76 P<.001	Words matching Non-word matching Word chains Sentence chains	.126* .005 .097 .185**
B 4	Orthographic knowledge	.510	.062	F=6.04 P<.001		
B 5	Phonological processing	.510	.000	F=.009 P=.991		
6	Speed of Processing	.511	.001	F=.575 P=.449	RAN Objects	-.042

*p < .05 **p < .01

Table 5.17: Hierarchical regression analysis to investigate predictors of Punjabi Reading Comprehension of for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change	Final Beta	
1	Gender, Grade and Age	.134	.134	F= 9.92 P<.001	Gender Grade Age	-.052 .206* -.181**
2	Listening comprehension	.165	.031	F=7.01 P<.01	Listening comprehension	.154**
3	Pseudo-word reading (Decoding)	.195	.030	F=7.05 P<.01	Pseudo-word Reading (Decoding)	.138*
A4	Phonological processing	.204	.009	F= 1.07 P=.344	Deletion Substitution	-.117 .099
A5	Orthographic knowledge	.266	.062	F=3.89 P<.01	Words matching Non-word matching Word chains Sentence chains	.100 .151* .101 -.050
B4	Orthographic knowledge	.258	.063	F=3.64 P<.01		
B5	Phonological processing	.266	.008	F= 1.04 P=.354		
6	Speed of processing	.271	.005	F= 1.32 P= .252	RAN objects	-.081

*p < .05 **p < .01

The results for the younger group (Grades 2 and 3) presented in Table 5.16, indicated that the Punjabi reading comprehension was predicted by Punjabi decoding and Punjabi orthographic knowledge, with significant beta weights. Listening comprehension did not show significant beta value (in contrast to Table 5.15) though, it showed significant variance predicted by model 1 (as indicated by significant R² change value). On the contrary, older group (Grades 4 and 5) results (presented in Table 5.17) showed highly significant beta weight for listening comprehension measure, decoding was also a reasonable predictor of Punjabi reading comprehension with partial significant beta value but it contributed the maximum variance (10%) in the whole model (with significant R² change value). Overall, for younger group decoding, orthographic knowledge and listening comprehension were the main predictors and

for older group listening comprehension and decoding were the main predictors of Punjabi reading comprehension. Phonological and speed of processing were showed non-significant levels of variability among both the groups.

5.3.3.2 Predictors of Hindi reading comprehension

To assess the predictors of Hindi reading comprehension the whole cohort was examined on the Hindi measures by performing hierarchical regression analyses. The same procedure used for Punjabi reading comprehension (consistent with SVR) was followed for Hindi regression analyses with all other Hindi measures. Table 5.18 show the results for Hindi reading comprehension.

Table 5.18: Hierarchical regression analysis to investigate predictors of Hindi Reading Comprehension (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.421	.421	F=95.17 P<.001	Gender Grade Age	-.061* .093 -.027
2	Listening comprehension	.464	.043	F=31.22 P<.001	Listening comprehension	.134**
3	Pseudo-word reading (Decoding)	.578	.115	F=106.3 P<.001	Pseudo-word reading (Decoding)	.244**
A4	Phonological processing	.592	.014	F=6.51 P<.01	Deletion Substitution	.062 .089
A5	Orthographic knowledge	.633	.041	F= 10.67 P<.001	Words matching Non-word matching Word chains Sentence chains	-.006 .112** .111** .141**
B4	Orthographic knowledge	.625	.047	F= 12.00 P<.001		
B5	Phonological processing	.633	.008	F= 4.10 P=.017		
6	Speed of processing	.635	.002	F=2.06 P= .152	RAN objects	-.056

*p < .05 **p < .01

Consistent with the Punjabi whole cohort results (Table 5.15) the results for Hindi reading comprehension (presented in Table 5.18) indicated that Hindi listening comprehension, decoding and orthographic level skills were the strong predictors of Hindi reading comprehension, which is consistent with SVR. Similar to Punjabi reading comprehension model (Table 5.15), again speed of processing was not a significant predictor of Hindi reading comprehension. Unlike Punjabi reading comprehension Hindi phonological skills predict Hindi reading comprehension, but it shared only 1% of variance and final beta weights for both phonological measures: deletion ($\beta = .062$) and substitution ($\beta = .089$) were non-significant (see further explanation of role of phonology from Tables 5.27 to 5.29). So, the predictors of Hindi and Punjabi reading comprehension (for all grades) were almost same.

Further similar regression analyses followed by the same prescribed order of Hindi measures, were performed across both the groups (younger and older). Table 5.19 and 5.20 present the results from regression analyses across the younger and older group.

Table 5.19: Hierarchical regression analysis to investigate predictors of Hindi Reading Comprehension for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.162	.162	F= 12.68 P<.001	Gender Grade Age	.029 .072 .061
2	Listening comprehension	.187	.025	F= 6.11 P<.01	Listening comprehension	.075
3	Pseudo-word reading (Decoding)	.406	.219	F= 71.99 P<.001	Pseudo-word reading (Decoding)	.173**
A4	Phonological processing	.424	.018	F= 2.98 P=.053	Deletion Substitution	.100 .009
A5	Orthographic knowledge	.547	.123	F= 12.87 P<.001	Words matching Non-word matching Word chains Sentence chains	-.011 .087 .298** .159*
B4	Orthographic knowledge	.539	.133	F= 13.79 P<.001		
B5	Phonological processing	.547	.008	F= 1.70 P=.187		
6	Speed of processing	.554	.007	F=2.81 P=.095	RAN objects	-.091

*p < .05 **p < .01

Table 5.20: Hierarchical regression analysis to investigate predictors of Hindi Reading Comprehension for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.166	.166	F=12.77 P<.001	Gender Grade Age	-.151** .132 -.076
2	Listening comprehension	.284	.117	F=31.32 P<.001	Listening comprehension	.216**
3	Pseudo-word reading (Decoding)	.398	.115	F=36.21 P<.001	Pseudo-word reading (Decoding)	.257**
A4	Phonological processing	.415	.016	F=2.64 P=.074	Deletion Substitution	-.007 .134
A5	Orthographic knowledge	.445	.030	F= 2.46 P= .047	Words matching Non-word matching Word chains Sentence chains	-.015 .092 .091 .084
B4	Orthographic knowledge	.434	.036	F= 2.92 P=.022		
B5	Phonological processing	.445	.011	F= 1.75 P=.177		
6	Speed of processing	.445	.001	F=.285 P= .594	RAN objects	-.035

*p < .05 **p < .01

Consistent with the Punjabi reading comprehension results for younger group (Grades 2 and 3, presented in Table 5.16), the results of Hindi reading comprehension for younger group (Grades 2 and 3, presented in Table 5.19) indicated the word decoding and orthographic skills were the strong predictors of Hindi reading comprehension and listening comprehension showed significant R² square value but did not show significant beta weight. Like, Punjabi reading comprehension phonological and speed of processing did not show any prediction in Hindi reading comprehension.

Results for older group (Grades 4 and 5) readers, presented by Table 5.20 were also similar with the Punjabi reading comprehension results for older group (see Table 5.17) where,

listening comprehension and decoding were the strong predictors of Hindi reading comprehension. Measures of phonological processing, speed of processing and orthographic knowledge skills did not show any significant beta values. However, these results from younger group was different from older group. The listening comprehension was seemed to be stronger predictor for older graders than their counterparts. As found in the Punjabi reading comprehension analyses, younger group analysis suggested a contribution from the Hindi orthographic measures in contrast to the older group. Hindi decoding predicted most of the variance across both groups, with the younger group showing more dependency on decoding (22% of variance). Speed was not statistically significant in both groups.

5.3.3.2 Predictors of English reading comprehension

To assess the level of prediction by combination of measures of English reading comprehension skills in the study, hierarchical regression analyses were performed on the whole cohort. The same procedure of Punjabi and Hindi regression analyses was followed for analyses of English reading comprehension. (see Table 5.21).

Table 5.21: Hierarchical regression analysis to investigate predictors of English reading comprehension (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.434	.434	F= 100.30 P< .001	Gender Grade Age	.026 .315** -.065
2	Listening comprehension	.465	.032	F=23.29 P<.001	Listening comprehension	.108**
3	Pseudo-word reading (Decoding)	.556	.091	F=79.88 P<.001	Pseudo-word reading (Decoding)	.136**
A4	Phonological processing	.563	.007	F= 3.045 P<.05	Deletion Substitution	.049 -.049
A5	Orthographic knowledge	.609	.046	F= 11.30 P<.001	Words matching Non-word matching Word chains Sentence chains	.073 .057 .148** .068
B4	Orthographic knowledge	.607	.051	F= 12.47 P<.001		
B5	Phonological processing	.609	.002	F= 1.014 P=.364		
6	Speed of Processing	.631	.023	F= 23.59 P<.001	RAN objects	-.188**

*p < .05 **p < .01

Results presented in Table 5.21 indicated that, phonological processing measure did not explain variability to the English comprehension. However, both listening comprehension and decoding measures were significant predictors of English reading comprehension (with significant beta values). Furthermore, the orthographic measures also added to the variability explained in English reading comprehension, though this was mainly related to the word chain task. This may suggest the influence of orthographic knowledge not only due to relationships with word decoding processes. Finally, speed of processing become a significant predictor of English reading comprehension, consistent with the component model ((Joshi & Aaron, 2000) and extended SVR (Tunmer & Chapman, 2012).

Similar (as Punjabi and Hindi languages) hierarchical regression analyses were conducted for each group (younger and older) to investigate the trends of prediction from younger readers to expert readers with the English measures. The hierarchy of entering independent variables with English reading comprehension as dependent variable is consistent with the previous regression analyses. Table 5.22 and Table 5.23 present the results for the younger and older groups.

Table 5.22: Hierarchical regression analysis to investigate predictors of English reading comprehension for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.104	.104	F= 7.64 P< .001	Gender Grade Age	-.014 .079 .024
2	Listening comprehension	.170	.065	F=15.42 P<.001	Listening comprehension	.169**
3	Pseudo-word reading (Decoding)	.353	.184	F= 55.35 P<.001	Pseudo-word reading (Decoding)	.179*
A4	Phonological processing	.380	.026	F= 4.11 P<.01	Deletion Substitution	.125 -.051
A5	Orthographic knowledge	.412	.033	F= 2.63 P<.05	Words matching Non-word matching Word chains Sentence chains	.077 -.014 .186* -.025
B4	Orthographic knowledge	.403	.050	F=3.96 P<.001		
B5	Phonological processing	.412	.035	F= 1.53 P=.220		
6	Speed of Processing	.447	.023	F= 23.59 P<.001	RAN objects	-.277**

*p < .05 **p < .01

Table 5.23: Hierarchical regression analysis to investigate predictors of English reading comprehension for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.113	.113	F=8.16 P<.001	Gender Grade Age	.069 .170** -.156**
2	Listening comprehension	.139	.026	F=5.73 P<.001	Listening comprehension	.039
3	Pseudo-word reading (Decoding)	.277	.138	F=36.37 P<.001	Pseudo-word reading (Decoding)	.183**
A4	Phonological processing	.279	.002	F=.254 P=.776	Deletion Substitution	-.016 -.046
A5	Orthographic knowledge	.391	.112	F= 8.49 P<.001	Words matching Non-word matching Word chains Sentence chains	.095 .112 .113 .152
B4	Orthographic knowledge	.391	.114	F= 8.71 P<.001		
B5	Phonological processing	.391	.000	F=.042 P=.959		
6	Speed of Processing	.408	.017	F= 5.24 P<.023	RAN objects	-.166**

*p < .05 **p < .01

In contrast to Punjabi and Hindi reading comprehension analyses for younger group (Grades 2 and 3, see Tables 5.16 and 5.19), analyses for English reading comprehension for younger group (presented in Table 5.22) indicated that listening comprehension showed variability in English reading comprehension with significant beta value. Unlike Punjabi and Hindi reading comprehension orthographic knowledge showed reasonable variability with significant beta weight (showed by word chain measure) and speed of processing was also a strong predictor with significant beta weight. Decoding showed significant beta value (with 18% variability in the model). Phonology did not showed prediction in English reading comprehension.

In older group (Grades 4 and 5) again the results (presented in Tables 5.23) were different from Punjabi and Hindi reading comprehension (see tables 5.17 and 5.20). In this group the

listening comprehension measures was showed significant R square change value (but beta value was also not significant), it means listening comprehension was not a reasonable predictor of English reading comprehension like Punjabi and Hindi reading comprehension analyses for older group. On contrary, decoding was a strong predictor with significant beta value. Unlike Punjabi and Hindi analyses orthography and speed of processing were strong predictors for expert readers of English reading comprehension. Overall, results showed that the listening comprehension, decoding, speed of processing and orthographic knowledge were the strong predictors of English reading comprehension at initial stage of acquiring language and for expert readers decoding, orthography and speed were the main predictors of English reading comprehension.

5.3.4 Predictors of decoding

A whole cohort (language wise) hierarchical regression analyses were performed to assess the level of prediction of word-level skills provided by various combinations of measures in the study. The pseudo-word reading measure representing decoding skills was used as dependent variable with the other independent variables entered in the prescribed order: first Gender, age (in months) and grade of child were entered to control the effect of all these variables, then phonological skills measures (deletion and substitution) were entered followed by orthographic measures (word matching, non-word matching, word chain and sentence chain) (order A in all tables). The order of entry was reversed phonological and orthographic measures (order B in all tables). Speed of processing measure (RAN objects) as separate from phonological and orthographic skills (order 4 in all tables). A final regression considered the listening comprehension measure (order 5 in all tables).

To assess the predictors of word-level skills of the whole cohort from initial stage to the stage of expertise, the regression analyses were performed group wise (younger and older group),

similar to reading comprehension regression analyses discussed above. With the previously used procedure for regression analyses for decoding.

5.3.4.1 Predictors of Punjabi decoding

As discussed above, hierarchical regression analyses were followed to assess the level of prediction of Punjabi reading decoding, provided by the combination of Punjabi measures in the assessment battery. Table 5.24 present the results of a hierarchical regression analysis for Punjabi decoding.

Table 5.24: Hierarchical regression analysis to investigate predictors of Punjabi decoding (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.419	.419	F= 94.65 P< .001	Gender Age Grade	-.014 .032 .039
A2	Phonological Processing	.547	.127	F= 54.98 P< .001	Deletion Substitution	.310** .216**
A3	Orthographic Knowledge	.578	.031	F= 7.21 P< .001	Words matching Non-word matching Word chains Sentence chains	.013 .010 .194** -.051
B2	Orthographic Knowledge	.476	.056	F=10.41 P< .001		
B3	Phonological Processing	.578	.103	F=47.14 P< .001		
4	Speed of Processing	.572	.005	F=4.318 p< 0.05	RAN objects	-.078*
5	Listening Comprehension	.581	.010	F=9.575 P< .01	Listening comprehension	.130**

*p < .05 **p < .01

The results presented in Table 5.24 indicated that all variables entered into this analysis predict independent variability, with the best predictor phonological skills. Orthographic

knowledge and speed was also statistically significant. Interestingly listening comprehension was also a good predictor of Punjabi word reading.

Further to analyse the prediction level across groups (younger and older), the same analyses were performed on each group (see Table 5.25 and 5.26 for results per group).

Table 5.25: Hierarchical regression analysis to investigate predictors of Punjabi decoding for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.097	.097	F=7.06 P<.001	Gender Grade Age	.017 .130 .011
A2	Phonological processing	.367	.270	F=41.54 P<.001	Deletion Substitution	.346** .197**
A3	Orthographic knowledge	.476	.109	F=9.96 P<.001	Words matching Non-word matching Word chains Sentence chains	.020 -.019 .310** -.053*
B2	Orthographic knowledge	.305	.208	F=14.45 P<.001		
B3	Phonological processing	.476	.171	F=31.17 P<.001		
4	Speed of Processing	.478	.002	F=.592 P= .443	RAN objects	-.035
5	Listening comprehension	.497	.019	F= 7.28 P= .008	Listening comprehension	.152**

*p < .05 **p < .01

Table 5.26: Hierarchical regression analysis to investigate predictors of Punjabi decoding for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.048	.048	F=3.23 <i>P</i> <.01	Gender Grade Age	-.020 -.128 -.014
A2	Phonological processing	.203	.155	F=18.45 <i>P</i> <.001	Deletion Substitution	.230** .230**
A3	Orthographic knowledge	.232	.029	F=1.74 <i>P</i> =.142	Words matching Non-word matching Word chains Sentence chains	-.052 .036 .106 .040
B2	Orthographic knowledge	.090	.042	F= 2.16 <i>P</i> =.076		
B3	Phonological processing	.232	.142	F=17.17 <i>P</i> <.001		
4	Speed of Processing	.259	.028	F=6.88 <i>P</i> < .01	RAN objects	-.190**
5	Listening comprehension	.267	.007	F= 1.86 <i>P</i> = .174	Listening comprehension	.103

p* < .05 *p* < .01

The results from younger group (Grades 2 and 3, presented in Table 5.25) suggested that phonological processing, orthographic knowledge and listening comprehension tend to be good predictors (with significant beta weights) of Punjabi decoding. Whereas, phonological processing and speed of processing proved to be relatively stronger predictor in older group (presented in Table 5.26). This may suggest that younger group readers focus on different parts of the word, whereas older group may be depending on whole word skills in Punjabi decoding.

5.3.4.1 Predictors of Hindi decoding

Again, similar regression analyses were performed to assess the predictors of Hindi word reading with all Hindi measures. (see Tables 5.27 to 5.29).

Table 5.27: Hierarchical regression analysis to investigate predictors of Hindi decoding (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.310	.310	F=58.80 P<.001	Gender Grade Age	-.020 -.139 .009
A2	Phonological processing	.513	.203	F=81.34 P<.001	Deletion Substitution	.207** .318**
A3	Orthographic knowledge	.560	.047	F=10.39 P<.001	Words matching Non-word matching Word chains Sentence chains	.161** -.033 .130* .053
B2	Orthographic knowledge	.438	.128	F= 22.09 P<.001		
B3	Phonological processing	.560	.122	F= 53.78 P<.001		
4	Speed of Processing	.569	.009	F=7.94 P< .01	RAN objects	-.113**
5	Listening comprehension	.574	.005	F= 4.45 P< .05	Listening comprehension	.092*

*p < .05 **p < .01

The result presented in Table 5.27 for Hindi decoding (whole cohort) revealed the similar results for Punjabi decoding (see Table 5.24). All variables: phonological processing, orthographic knowledge, speed of processing predict independent variability with significant beta value. Like, Punjabi decoding analysis (for whole cohort) listening comprehension also showed variability in Hindi decoding with significant beta weight. After this to assess the level of prediction across groups (younger and older), the same analyses were conducted (see Table 5.28 for younger group and Table 5.29 for older group).

Table 5.28: Hierarchical regression analysis to investigate predictors of Hindi decoding for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.063	.063	F=4.38 P<.001	Gender Grade Age	-.091 -.008 .008
A2	Phonological processing	.431	.639	F=63.26 P<.001	Deletion Substitution	.186** .300**
A3	Orthographic knowledge	.540	.109	F=11.32 P<.001	Words matching Non-word matching Word chains Sentence chains	.136* -.085 .291** .034
B2	Orthographic knowledge	.374	.312	F= 24.01 P<.001		
B3	Phonological processing	.540	.166	F= 34.57 P<.001		
4	Speed of Processing	.548	.008	F=3.39 P= .067	RAN objects	-.097
5	Listening comprehension	.551	.002	F= 1.01 P= .316	Listening comprehension	.054

*p < .05 **p < .01

Table 5.29: Hierarchical regression analysis to investigate predictors of Hindi decoding for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.067	.067	F=4.61 P<.001	Gender Grade Age	-.037 -.142 .074
A2	Phonological processing	.263	.196	F=25.20 P<.001	Deletion Substitution	.198* .252**
A3	Orthographic knowledge	.297	.034	F=2.25 P=.066	Words matching Non-word matching Word chains Sentence chains	.080 -.035 .014 .060
B2	Orthographic knowledge	.168	.101	F= 5.72 P<.001		
B3	Phonological processing	.297	.128	F= 16.97 P<.001		
4	Speed of Processing	.309	.013	F=3.38 P< .05	RAN objects	-.129*
5	Listening comprehension	.314	.004	F= 1.11 P= .294	Listening comprehension	.071

*p < .05 **p < .01

The results presented in Tables 5.28 for younger group (grades 2 and 3) showed that the phonological processing, orthographic knowledge and speed of processing were the main predictors of Hindi word decoding. Whereas, the results from Hindi decoding analyses for older group (Grades 4 and 5, presented in Table 5.29) showed that the phonological processing and speed of processing were the good predictors.

5.3.4.1 Predictors of English decoding

To assess the level of prediction of English word reading (decoding) again the similar regression analyses were performed with the same procedure (see Table 5.30 to Table 5.32).

Table 5.30: Hierarchical regression analysis to investigate predictors English decoding (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.303	.303	F= 56.90 P<.001	Gender Grade Age	.016 -.140* .157**
A2	Phonological processing	.535	.232	F= 97.73 P<.001	Deletion Substitution	.162** .279**
A3	Orthographic knowledge	.637	.102	F= 27.04 P<.001	Words matching Non-word matching Word chains Sentence chains	.074 -.051 .164** .242**
B2	Orthographic knowledge	.535	.232	F= 48.41 P<.001		
B3	Phonological processing	.637	.102	F= 54.42 P<.001		
4	Speed of Processing	.648	.011	F=11.84 P<.001	RAN objects	-.127**
5	Listening comprehension	.648	.000	F=.032 P=.857	Listening comprehension	.007

*p < .05 **p < .01

The results presented in Table 5.30, showed that all independent variables are the predictors of English word reading (decoding), except listening comprehension. Phonological skills, orthographic skills and speed of processing were the main stronger predictors of English decoding. Further group wise regression analyses were performed to see the variability among both groups (younger and older). Table 5.29 and Table 5.30 present the results of these regression analyses.

Table 5.31: Hierarchical regression analysis to investigate predictors of English decoding for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.071	.071	F=4.99 P<.001	Gender Grade Age	.040 -.030 .020
A2	Phonological processing	.496	.426	F=82.35 P<.001	Deletion Substitution	.142 .336**
A3	Orthographic knowledge	.605	.109	F=13.12 P<.001	Words matching Non-word matching Word chains Sentence chains	.019 .073 .195** .162**
B2	Orthographic knowledge	.453	.383	F= 33.78 P<.001		
B3	Phonological processing	.605	.151	F= 36.58 P<.001		
4	Speed of Processing	.623	.018	F=9.19 P<.01	RAN objects	-.113**
5	Listening comprehension	.630	.007	F= 3.36 P= .068	Listening comprehension	-.088

* p < .05 **p < .01

Table 5.32: Hierarchical regression analysis to investigate predictors of English decoding for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta
1	Gender, Grade and Age	.050	.050	F=3.37 P<.05	Gender Grade Age	.020 -.086 .187**
A2	Phonological processing	.314	.264	F=36.58 P<.001	Deletion Substitution	.180** .215**
A3	Orthographic knowledge	.470	.156	F=13.65 P<.001	Words matching Non-word matching Word chains Sentence chains	.099 -.129* .128 .250**
B2	Orthographic knowledge	.354	.304	F= 22.09 P<.001		
B3	Phonological processing	.470	.116	F= 20.35 P<.001		
4	Speed of Processing	.485	.015	5.42 P<.05	RAN objects	-.149*
5	Listening comprehension	.491	.007	F= 2.38 P= .125	Listening comprehension	.088

*p < .05 **p < .01

The results of the regression analyses indicated that in both groups major contribution was of phonological and orthographic skills along with speed of processing. Interestingly younger group showed partial contribution of listening comprehension in English word reading.

5.3.5 Models based on result of research question 1

Overall the findings revealed that Punjabi, Hindi and English reading comprehension levels were predicted by understanding level and word level skills and word level skills were predicted by phonological skills, orthographic skills and speed of processing. In addition, the orthographic skills may predict the Punjabi and Hindi reading comprehension by younger group. While the English reading comprehension was predicted by orthographic knowledge (by older group) and speed of processing (by both groups). This is summarized in the models presented by figure number 5.1, 5.2 and 5.3

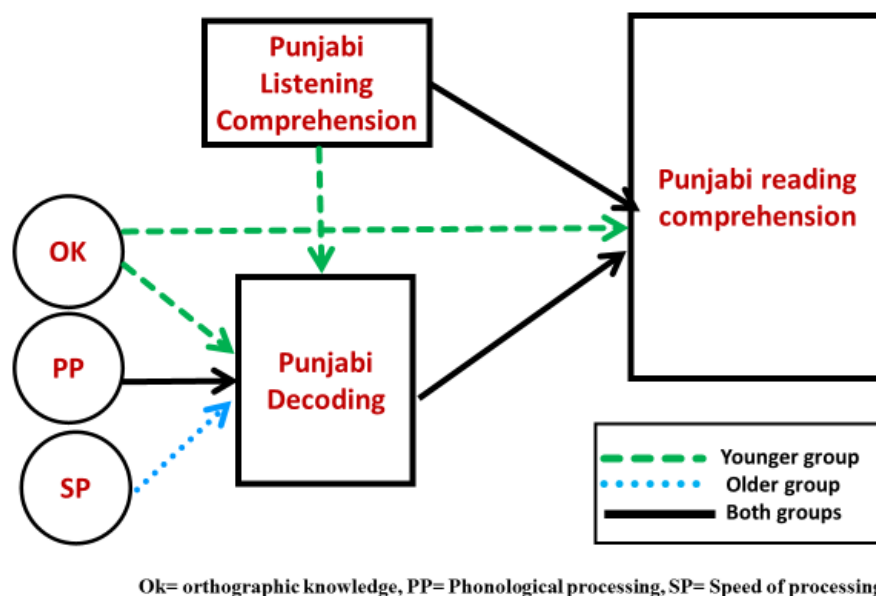


Figure 5.1: Multilingual Punjabi reading model

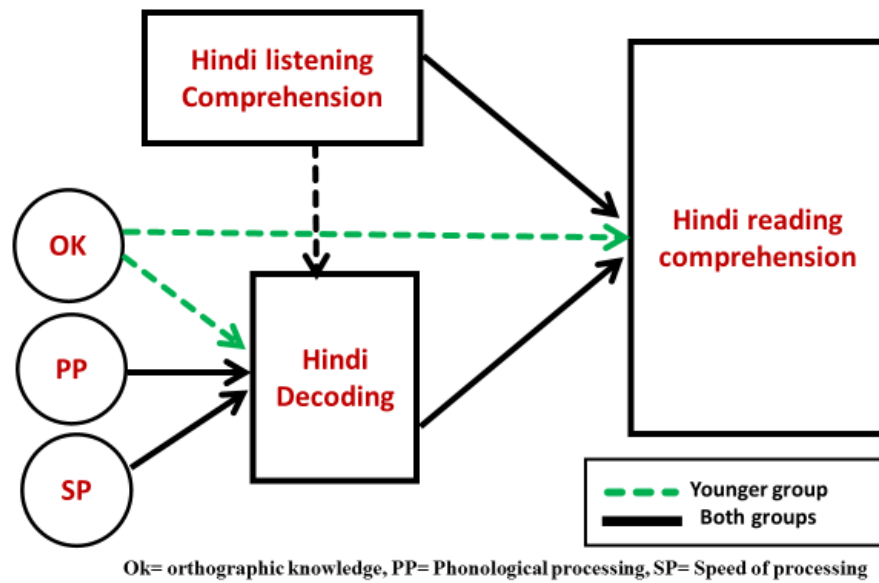


Figure 5.2: Multilingual Hindi reading model

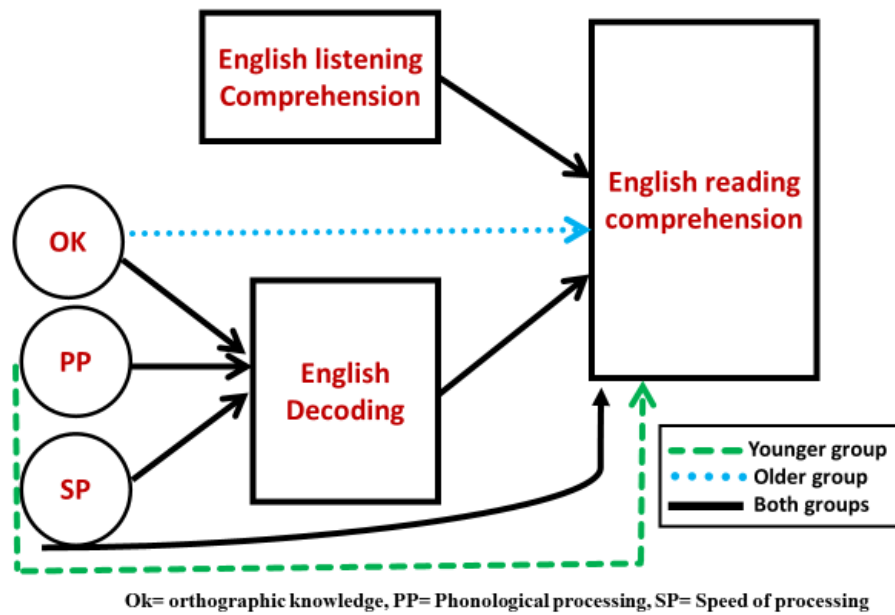


Figure 5.3: Multilingual English reading model

5.4 Discussion

An initial objective of this study was to investigate the potential predictors of reading comprehension in multilingual children. To do this, the cohort was assessed on listening comprehension skills, decoding skills, phonological skills, orthographic skills and speed of processing skills. These skills were based on reading models called simple view of reading (Gough & Tunmer, 1986; Hoover & Gough, 1990; Tunmer & Chapman, 2012) and component model of reading (Joshi & Aaron, 2000). These reading models were developed to assess the word level and reading comprehension skills among monolingual readers, but also have the potential to assess reading development across languages (Coltheart et al., 2001; Kendeou et al., 2013; Sadeghi, 2013). The measures (in Punjabi, Hindi and English) used in this study proved to be reasonable indicators of Punjabi, Hindi and English reading comprehension. The results of this study indicated that Punjabi, Hindi and English reading comprehension levels can be predicted by listening comprehension and word decoding. Further, word decoding level was predicted by phonological and orthographic skills regardless of the deep or shallow nature of all three orthographies. These findings supported the dual-route model and connectionist model (Coltheart et al., 2001; Plaut et al., 1996) of word reading. Punjabi word decoding predicted by phonological and orthographic skills, as well as speed of processing among older readers (Grades 4 and 5) and listening comprehension among younger readers (Grades 2 and 3). Hindi word decoding had the contribution of same predictors as Punjabi word decoding, except speed of processing, which partially predicted the Hindi word decoding (by both the younger and older groups). Hindi listening comprehension showed the significant variance to Hindi decoding, but this contribution was observed in the regression analysis with all grades not within the younger and older group analyses. English word decoding was strongly predicted by phonological skills, orthographic skills and speed of processing, while listening comprehension was a

partial predictor (among the younger group). The contribution of listening comprehension in Punjabi, and Hindi word decoding was evident the presence of linguistic skills from fairly young age among these multilingual readers. Kendeou et al. (2013); Tunmer and Chapman (2012) & Tobia and Bonifacci (2015), also supported the role of oral/listening comprehension among primary school readers in different orthographies. These findings called for further longitudinal study with other measures of linguistic skills e.g. vocabulary and syntactic tasks.

Predictors of Punjabi, Hindi and English reading comprehension were assessed on the basis of components of the simple view of reading (listening comprehension and decoding) through a series of regression analyses. The findings from these analyses supported the two components of the simple view of reading. Along with these two components the Punjabi, Hindi and English orthographic knowledge (after controlling for word decoding) directly predicted Punjabi, Hindi (among Grades 2 and 3) and English reading comprehension (among Grades 4 and 5). The results from hierarchical regression analyses of Punjabi and Hindi are consistent with the study on Persian reading comprehension (Sadeghi, 2013).

Persian orthography is shallow when vowelised and opaque when non-vowelised. This result can possibly be explained on the basis of orthographic depth hypothesis (Katz & Frost, 1992), which states that the readers adopt a strategy based on the orthographic consistency. Research suggests that the readers of consistent orthographies can rely on grapheme-phoneme conversion, whereas the readers of inconsistent orthographies would rely on orthographic whole word reading (Wimmer & Goswami, 1994). Punjabi and Hindi orthographies are visually complex due to the non-linear writing system (see chapter 3 for further detail) (Bhatia, 1993; Kumar et al., 2010; Vaid & Gupta, 2002) and the findings from the present study support the complexity of Punjabi and Hindi. The results from English reading

comprehension showed the complexity of English orthography, which is already reported in the literature (Share, 2008).

Speed of processing was found to make a direct contribution to English reading comprehension. These results were consistent with the simple view of reading (Tunmer & Chapman, 2012) and component model of reading (Joshi & Aaron, 2000). In addition, orthographic knowledge was found to be influential among older readers (Grades 4 and 5) and phonological processing contributed to English reading comprehension in younger group (Grades 2 and 3).

The secondary objective of this study was to investigate whether these predictors are similar across the three orthographies. If yes, are they similar based on orthographic similarity? Punjabi and Hindi orthographies are similar, as they are both derived from Sanskrit (for more detail see Chapter 3). From these results, it is evident that the predictors of Punjabi and Hindi reading comprehension were same. This may have been due to their orthographic similarity. English is opaque when compared to Punjabi and Hindi, so the result of English reading comprehension was different from Punjabi and Hindi reading comprehension. This may have been due to the difference in English, Hindi and Punjabi orthographies.

5.5 Conclusion

Generally, the findings of the present study indicated that Punjabi, Hindi and English reading comprehension supported the components of the simple view of reading: listening comprehension and decoding. The latter being predicted by phonological and orthographic skills (models outlined in Figures 5.1-5.3). Additional contribution of orthographic knowledge observed in Punjabi, Hindi and English Reading comprehension: in Punjabi and Hindi by younger readers, and in English by older readers. In English reading comprehension, phonological processing played an important role in the initial years of literacy development

(Grades 2 and 3). The significantly stronger role of processing speed in English reading comprehension in the current study could be explained by using the component model of reading.

In general, Punjabi and Hindi reading comprehension were predicted by nearly the same predictors, but with English reading comprehension there was some variations in these predictors. To investigate the influence of Punjabi and Hindi reading on English reading comprehension, further analyses of research question 2 were performed with the same multilingual cohort.

Chapter 6

Study Two: Cross-linguistic Influence of Punjabi and Hindi on English Reading Comprehension among Multilingual Children

6.1 Introduction

In past 20 years, a substantial body of research carried out on the processes involved in the development of literacy skills among individuals who speak more than one language. A number of these studies have examined cross-linguistic transfer in second language reading comprehension (Schwartz et al., 2008). The majority of such research has investigated the effects of an individual's first language on the development of reading in their second. In contrast, there is paucity of research examining potential cross-linguistic effects of first and/or second language processes on third language reading comprehension skills. Study 2, reported in this chapter, presents further analyses on the multilingual readers who formed the participants in this research (presented in this chapter 5 of this thesis), and who have developed spoken and reading skills in three languages; i) Punjabi as their mother tongue/first language, ii) Hindi as a second language, and iii) English as a third language. Both cross-sectional (Grades 2 to 5) and cross-linguistic (Punjabi, Hindi and English) analyses were used with the aim to determine evidence for cross-linguistic influences from Punjabi and/or Hindi language processes to English reading comprehension. This provided the opportunity to examine further the multilingual English reading model proposed in this thesis (chapter 5-figure 5.3) and to propose underlying cognitive skills that may transfer across the languages within a tri-lingual acquisition context. The specific tri-lingual context under investigation allows a further opportunity in investigating whether two orthographies that are similar (Punjabi and Hindi) show similar supportive or interfering influences on the development of reading skills in a third, relatively different orthography (English).

6.2 Method

6.2.1 Participants

The participants for this study were same 440 (with male, female ratio 1:1) multilingual children of two elementary schools (Grades 2 to 5), from Punjab (India) reported in chapter 5 (see Table 5.1 of chapter 5 for demographic details). The same criteria for excluding from analyses was used in this study as for Study 1 (see table 5.2 in previous chapter), which meant that the current analyses were based on data from 397 children. Participants of this study were the Punjabi language speakers (already discussed in chapter 5), started to learn Punjabi, Hindi and English at initial stage of their formal literacy (see education system in Punjab in chapter 4, for more detail).

6.2.2 Measures

The analyses for present study were conducted with the 6 measures were selected from the assessment battery developed for Study 1 in this thesis. Out of these 6 measures, only reading comprehension in English (not in Punjabi and Hindi) was used as the dependent variable and the remaining 5 measures were used in each language, i.e. Punjabi, Hindi and English as independent variables. The selected measures were: English Reading Comprehension (reading passages followed by questions); Listening Comprehension (answering questions after orally presented passages); Pseudo-word Reading (naming a new letter string: ‘zutter’); Deletion (deleting a sound from a spoken word: ‘cup without /k/ sound’), considered as indicative of phonological processing; Word Chain (random real words presented without spaces: helpfunafterthe), considered as indicative of orthographic knowledge; and RAN objects (naming drawings of familiar objects as fast as possible with accuracy), considered as indicative of the speed of access the phonological representations of objects.

The measures used in this study (from the assessment battery) were selected to examine the influences of Punjabi and Hindi reading skills on English reading comprehension and English decoding levels. Measures of listening comprehension skills, phonological skills, orthographic skills and speed of processing skill in Punjabi, Hindi and English were selected from the assessment battery. In the main assessment battery (see Table 5.3) there were two phonological processing measures and four orthographic knowledge measures. In order to limit the number of measures within analyses and to allow measures from two languages to be used as predictors, only one measure of phonological and orthographic processing was selected. The rationale for this was to limit the reduction in power of the analyses following entry of relatively large numbers of variables while still allowing the inclusion of measures from two languages. While selecting these measures the contribution of each measure in Study 1 (within languages) was taken into consideration. Based on this, deletion and word chain were considered to be good predictors of reading in English. In comparison to substitution, deletion showed larger correlations with English reading comprehension across each of the three languages (see Table 5.9). Similarly, for each of the three languages, the word chains measure showed the largest correlation with English reading comprehension of any of the orthographic measures (see Tables 5.10 and 5.11). These suggest that, across the languages within this study, these two measures have the potential to be the most predictive of English reading within each of these areas of processing.

6.3 Results

6.3.1 Examining the cross-linguistic influence of reading comprehension skills from Punjabi/Hindi to English reading comprehension

In order to investigate the cross-linguistic influence of reading comprehension skills from Punjabi and Hindi to English, two sets of six hierarchical regression analyses were performed. As in the previous chapter, the simple view of reading was used as a base for the theoretical rationale for the order of entry of variables into the regressions. The dependent variable for the six regression analyses in this initial set of analyses was English reading comprehension. For each analysis age, gender and grade were entered first, as control variables. The remaining variables were entered in four blocks: listening comprehension, decoding, phonological processing, orthographic knowledge and speed of processing – with phonological processing preceding orthographic knowledge in half of the analyses (referred to as A) and orthographic knowledge preceding phonological processing in the other half (referred to as B). In each block, the Punjabi or Hindi measures were entered along with the corresponding English measures to examine their unique contribution to English reading comprehension. Tables 6.1 to 6.3 (in sub-section 6.3.1.1) present the results for the analyses examining the cross-linguistic influence of Punjabi measures on English reading comprehension. Tables 6.4 to 6.6 (in 6.3.1.2) presents the analyses investigating potential influences of Hindi measures on English reading comprehension. The first table in each sub-section reports the findings for the whole cohort. These are followed by analyses focusing on younger group (Grades 2 and 3) and then older group (Grades 4 and 5), following the format used in the previous chapter.

6.3.1.1 Examining the cross-linguistic influence of Punjabi (in addition to English) on English reading comprehension

Table 6.1 presents the results of the analyses for the whole cohort of children investigating potential additional contribution of Punjabi processing areas on English reading comprehension. The whole cohort was then divided into younger group (Grades 2 and 3) and older group (Grades 4 and 5) and similar analyses to those for the whole cohort performed.

Table 6.2 shows the analyses for the younger and Table 6.3 for the older children.

Table 6.1: Hierarchical regression analyses to investigating the cross-linguistic influence of Punjabi (in addition to English) on English Reading Comprehension (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.434	.434	F= 100.30 P<.001			
2	Listening comprehension	.478	.045	F= 16.71 P<.001	Listening comprehension	.085*	.082
3	Pseudo-word reading (decoding)	.566	.088	F=.39.33 P<.001	Pseudo-word reading(decoding)	.158**	.015
A4	Phonological processing	.574	.008	F=3.51 P<.05	Deletion	.034	-.080
A5	Orthographic knowledge	.609	.036	F= 17.60 P<.001	Word Chains	.170**	.090
B4	Orthographic knowledge	.606	.040	F=19.57 P<.001			
B5	Phonological processing	.609	.004	F=1.759 P=.174			
C6	Speed of Processing	.632	.022	F= 11.70 P<.001	RAN objects	-.197**	.036

*p < .05 **p < .01

The model presented in Table 6.1 predicted 63% variability in English reading comprehension. This level of prediction was similar to that found in the corresponding whole cohort English reading comprehension model derived from Study 1. Consistent with this similar level of prediction across two studies, the Punjabi measures did not explain any significant additional variability in English reading comprehension to that provided by the English measures alone. As in Study 1, there was evidence for listening comprehension, decoding, orthographic knowledge and naming speed to predict the variability in English reading comprehension. However phonological processing explained only a small amount of variability in English reading comprehension when preceded by decoding and was not significant predictor based on the no-significant beta value (but see Table 6.7 for further discussion of influences of phonological processing in the analysis of English decoding).

Table 6.2: Hierarchical regression analyses to investigate the cross-linguistic influence of Punjabi (in addition to English) on English Reading Comprehension for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.104	.104	F= 7.64 <i>P</i> <.001			
2	Listening comprehension	.191	.087	F=10.53 <i>P</i> <.001	Listening comprehension	.140*	.074
3	Pseudo-word reading (decoding)	.360	.168	F=25.37 <i>P</i> <.001	Pseudo-word reading(decoding)	.167*	-.057
4	Phonological processing	.379	.019	F=2.95 <i>P</i> <.05	Deletion	.096	.017
A5	Orthographic knowledge	.412	.033	F= 5.31 <i>P</i> <.001	Word Chains	.214**	.004
B4	Orthographic knowledge	.404	.038	F=7.16 <i>P</i> <.001			
B5	Phonological processing	.412	.008	F=1.22 <i>P</i> =.297			
6	Speed of Processing	.447	.035	F= 5.97 <i>P</i> <.001	RAN Objects	-.244**	.033

p* < .05 *p* < .01

Table 6.3: Hierarchical regression analyses to investigate the cross-linguistic influence of Punjabi (in addition to English) on English Reading Comprehension for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.113	.113	F= 8.16 P<.001	Gender Grade Age		
2	Listening comprehension	.159	.046	F=5.16 P<.01	Listening comprehension	.067	.118*
3	Pseudo-word reading (Decoding)	.310	.151	F= 20.54 P<.001	Pseudo-word reading(Decoding)	.277**	-.074
4	Phonological processing	.344	.035	F=4.90 P<.01	Deletion	.027	-.256**
A5	Orthographic knowledge	.403	.059	F= 9.03 P<.001	Word Chains	.079	.173**
B4	Orthographic knowledge	.379	.069	F=10.38 P<.001			
B5	Phonological processing	.403	.024	F=3.67 P<.05			
C6	Speed of Processing	.432	.030	F=4.74 P<.01	RAN objects	-.217**	.002

*p < .05 **p < .01

Consistent with the whole cohort analyses (Table 6.1), the results for younger group (Grades 2 and 3 presented in Table 6.2) indicated no evidence for the Punjabi measures to add to the level of prediction provided by English measures. As in Study 1 (see Table 5.22), about 48% of the variability in English reading comprehension was explained, with listening comprehension, decoding, orthographic knowledge and speed of processing. The beta values of listening comprehension, decoding, orthographic knowledge and speed of processing were of significant. Again, phonological processing was not a unique predictor of English reading

comprehension when other measures were taken into account. The overall model of younger group was very similar to that for the whole cohort analyses presented in Table 6.1.

However, the analysis of the older group of children of this study (Table 6.3) indicated that additional variability in English reading comprehension was explained by the addition of the Punjabi measures. This led to increase the variability explained in this model compared to the corresponding analysis in Study 1 (contrast with Table 5.23) from 41% to 43% in this Study 2. Although small, the increase was associated with an increase in the beta values within the model. In addition to the English decoding and rapid naming measure, the Punjabi measures of listening comprehension, phonological processing and orthographic knowledge also showed significant beta values. These results argued for a mixture of first language and English language providing a better range of English reading comprehension predictors than English measure alone in older group. However, it is interesting to note that the phonological processing measure showed a negative beta value, suggesting the possibility that Punjabi phonological skills may have been associated with poorer scores in English reading comprehension (this point will be discussed further in the next chapter).

6.3.1.2 Examining the cross-linguistic influence of Hindi (in addition to English) on English reading comprehension

Table 6.4 presented the results of the analysis for the whole cohort of children in order to investigate the potential additional contribution of Hindi processing areas (in addition to English) on English reading comprehension

Table 6.4: Results of hierarchical regression analyses to investigate the cross-linguistic influence of Hindi (in addition to English) on English Reading Comprehension (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Hindi
1	Gender, Grade and Age	.434	.434	F= 100.3 P<.001			
2	Listening comprehension	.477	.043	F=16.23 P<.001	Listening comprehension	.079	.069
3	Pseudo-word reading (decoding)	.574	.097	F=44.39 P<.001	Pseudo-word reading(decoding)	.116**	.096*
A4	Phonological processing	.578	.004	F=1.5 P=.193	Deletion	.036	-.073
A5	Orthographic knowledge	.612	.034	F= 16.77 P<.001	Word chains	.139**	.111*
B4	Orthographic knowledge	.611	.036	F=18.09 P<.001			
B5	Phonological processing	.612	.001	F=.508 P=.602			
6	Speed of processing	.632	.021	F= 10.72 P<.001	RAN objects	-.178**	-.010

*p < .05 **p < .01

In contrast to the whole cohort analyses including Punjabi measures, when Hindi measures were including in the analyses of English reading comprehension, they explained unique variance in addition to that accounted for the English measures. However, the overall variability explained was no more than accounted for in Study 1(see Table 5.21); both the Study 1 and Study 2 analyses accounted for about 63% of the variability in English reading comprehension. The difference with addition of Hindi measures in contrast to Punjabi measures (contrast Tables 6.1 and 6.4) was significant beta weights for Hindi alongside English measures; both English and Hindi decoding showed significant beta values, as did English and Hindi orthographic knowledge. Only rapid naming in English showed significant

beta value that was not associated with a corresponding significant Hindi measure beta value. Interestingly, English listening comprehension did not show a significant beta value (in contrast to Study 1), though combines with the Hindi measure, listening comprehension did explain significant change in the variance predicted by the model (as indicated by the significant R-square change value). Overall, the findings seem to suggest that for the processing areas of listening comprehension, decoding and orthographic knowledge, the Hindi measures explained some common variance to their English counterparts; though the English measures still seemed to be overall better predictors. Further, to investigate the influence of Hindi (in addition to English) as per younger and older readers, similar analyses were conducted. Results of these analyses are presented in Table 6.5 and 6.6 below.

Table 6.5: Results of hierarchical regression analyses to investigate the cross-linguistic influence of Hindi (in addition to English) on English Reading Comprehension for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Hindi
1	Gender, Grade and Age	.104	.104	F= 7.64 P<.001			
2	Listening comprehension	.174	.070	F=8.23 P<.001	Listening comprehension	.186**	-.014
3	Pseudo-word reading(decoding)	.370	.196	F=29.60 P<.001	Pseudo-word reading(decoding)	.090	.079
4	Phonological processing	.386	.016	F=2.48 P=.087	Deletion	.040	.068
A5	Orthographic knowledge	.418	.033	F= 5.36 P<.001	Word Chains	.200*	.025
B4	Orthographic knowledge	.410	.040	F=6.53 P<.001			
B5	Phonological processing	.418	.008	F=1.37 P=.257			
6	Speed of Processing	.449	.031	F= 5.20 P<.001	RAN Objects	-.206**	-.022

*p < .05 **p < .01

Table 6.6: Results of hierarchical regression analyses to investigate the cross-linguistic influence of Hindi (in addition to English) on English Reading Comprehension for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Hindi
1	Gender, Grade and Age	.113	.113	F= 8.16 P<.001			
2	Listening comprehension	.175	.062	F=7.16 P<.001	Listening comprehension	-.009	.145*
3	Pseudo-word reading(decoding)	.303	.128	F=17.19 P<.001	Pseudo-word reading(decoding)	.225**	.054
4	Phonological processing	.318	.016	F=2.12 P=.123	Deletion	.041	-.237**
A5	Orthographic knowledge	.384	.066	F= 9.89 P<.001	Word Chains	.109	.183*
B4	Orthographic knowledge	.368	.065	F=9.53 P<.001			
B5	Phonological processing	.384	.017	F=2.48 P=.086			
6	Speed of Processing	.414	.030	F= 4.65 P<.01	RAN objects	-.225**	.031

*p < .05 **p < .01

In contrast to the difference above (i.e., between the Punjabi and Hindi whole cohort analyses), the analyses of the younger and older grade groups assessing the effect of adding Hindi measures as potential predictors of English reading comprehension were very similar to the corresponding analyses involving the Punjabi measures. For the younger group (Grades 2 and 3 presented in Table 6.5), only the English measures showed significant beta scores, whereas for the older group (Grades 4 and 5 presented in Table 6.6) both English and Hindi measures produced significant beta values. In the case of Grades 2 and 3 analyses, listening comprehension, orthographic knowledge and rapid naming produced significant betas, and

some 45% of variance was explained in the model. These results correspond to the level of variance explained and significant beta values found in Study 1 (Table 5.22); though in previous study, the English decoding measure also produced a significant beta score for younger group. These findings were consistent with the results of the Punjabi analyses above (Table 6.2) and suggest that for the younger children in this cohort (Grades 2 and 3), English reading comprehension was primarily predicted by English measures of underlying skills.

The older group (Grades 4 and 5) Hindi additional measures showed similar pattern to the corresponding Punjabi additional measures analyses. In addition to the English decoding and rapid naming measures, the Hindi measures of listening comprehension, orthographic knowledge and phonological processing also showed significant beta values; though that for phonological processing was again negative (this will be discussed further in the next chapter). However, the overall level of prediction of English reading comprehension provided by both the English and Hindi measures in these analyses was no more than that of English reading measure alone (see Table 5.23): both Study 1 and Study 2 explained 41% of variability in English reading comprehension. As with the whole cohort analyses (Table 6.4), these findings suggest that the Hindi measures explained common variance to their English counter parts.

6.3.2 Examining the cross-linguistic influence of word level skills from Punjabi/Hindi to English decoding (on the bases of multilingual English model of reading)

To examine the cross-linguistic influence of Punjabi and Hindi on English decoding, whole cohort hierarchical regression analyses were performed. Again, these analyses were performed in two sets with total six regression analyses and this time English pseudo word reading was used as dependent variable for all six analyses. For each of six analyses age (in months), gender and grade used as controlled variables and other predictors were entered in

four blocks in the following order: phonological processing (deletion), orthographic knowledge (word chain), speed of processing (RAN objects) and listening comprehension- with phonological processing preceding orthographic knowledge (referred as A) and orthographic knowledge preceding by phonological processing (referred as B). In each block Punjabi and Hindi measures were entered along with correspondent the English measures to their contribution to English decoding. Tables 6.7 to 6.9 (in sub-section 6.3.2.1) presents the results for the analyses assessing the cross-linguistic influences of Punjabi measures on English decoding. Tables 6.10 to 6.12 (in sub-section 6.3.2.2) presents the results for the analyses assessing the cross-linguistic influences of Punjabi measures on English decoding.

6.3.2.1 Examining the cross-linguistic influence of Punjabi (in addition to English) on English decoding

Table 6.7 presents the results of the analyses for the whole cohort of children investigating potential additional contribution of Punjabi processing areas on English decoding.

Table 6.7: Hierarchical regression analyses to investigate the cross-linguistic influence of Punjabi (in addition to English) on English Decoding (all Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.303	.303	F= 56.90 P< .001	Gender Age Grade		
A2	Phonological Processing	.507	.204	F= 81.01 P< .001	Deletion	.279**	.166**
A3	Orthographic Knowledge	.581	.074	F= 34.12 P< .001	Word chains	.287**	.025
B2	Orthographic Knowledge	.483	.181	F=68.37 P< .001			
B3	Phonological Processing	.581	.097	F=45.07 P< .001			
4	Speed of Processing	.600	.020	F=9.52 P<.001	RAN objects	-.169**	.000
5	Listening comprehension	.601	.001	F=.476 P=.622	Listening comprehension	.042	-.021

*p < .05 **p < .01

The result presented in Table 6.7 indicating that phonological processing, orthographic knowledge and speed of processing predicts the variability in English decoding (which is predicted by English measures). These predictors were consistent with the Study 1 (see Table 5.30). Interestingly, Punjabi phonological processing also explained additional variability in English decoding with significant beta value. In whole cohort analyses: in both Study 1 and Study 2, listening comprehension did not explain any significant variability in English decoding.

To examine these influences further across the grades, the same analyses were performed on younger group (Grades 2 and 3) and older group (Grades 4 and 5) (see Table 6.8 and 6.9).

Table 6.8: Hierarchical regression analyses to investigate the cross-linguistic influence of Punjabi (in addition to English) on English decoding for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.071	.071	F= 4.99 <i>P</i> < .001	Gender Age Grade		
A2	Phonological Processing	.453	.383	F= 68.25 <i>P</i> < .001	Deletion	.241**	.193**
A3	Orthographic Knowledge	.541	.088	F= 18.45 <i>P</i> < .001	Word chains	.303**	.031
B2	Orthographic Knowledge	.421	.350	F=58.91 <i>P</i> < .001			
B3	Phonological Processing	.541	.120	F=25.32 <i>P</i> < .001			
4	Speed of Processing	.574	.032	F=7.27 <i>p</i> < .001	RAN objects	-.226**	.115*
5	Listening comprehension	.582	.008	F=1.92 <i>P</i> = .149	Listening comprehension	-.097	.098

p* < .05 *p* < .01

Table 6.9: Hierarchical regression analyses to investigate the cross-linguistic influence of Punjabi (in addition to English) on English decoding for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Punjabi
1	Gender, Grade and Age	.050	.050	F= 3.37 <i>P</i> < .01	Gender Age Grade		
A2	Phonological Processing	.273	.223	F= 29.08 <i>P</i> < .001	Deletion	.288**	.111
A3	Orthographic Knowledge	.380	.107	F= 16.24 <i>P</i> < .001	Word chains	.253**	.012
B2	Orthographic Knowledge	.250	.200	F=35.34 <i>P</i> < .001			
B3	Phonological Processing	.380	.130	F=19.66 <i>P</i> < .001			
4	Speed of Processing	.423	.043	F=7.008 <i>P</i> < .001	RAN objects	-.210**	-.088
5	Listening comprehension	.435	.012	F=1.96 <i>P</i> = .144	Listening comprehension	.119*	-.070

p* < .05 *p* < .01

Consistent with the whole cohort analyses (Table 6.7), the results of younger group (Grades 2 and 3 presented in Table 6.8) indicated the evidence of additional variability in English decoding by addition of Punjabi measures. In addition to English phonological, orthographic, and speed of processing, the Punjabi measures of phonological processing and speed of processing showed significant beta values. This may suggest that younger group readers influenced by first language while developing their decoding skills in English. English listening comprehension (in Table 6.8) contribute to English decoding (in contrast to Table 5.31). However, the remaining English decoding predictors were similar in both Study 1 and Study 2.

In contrast to the whole cohort and younger group (Tables 6.7 and 6.8), the analysis of the older group (Grades 4 and 5) (Table 6.9) indicated no evidence for Punjabi measures adding

to the level of prediction provided by the English measures. As Study 1 (see Table 5.32) English decoding predicted by phonological processing and orthographic knowledge, but after addition of Punjabi measures in Study 2 English speed of processing also showed the significant beta value. In contrast to Study 1 English listening comprehension explained variability in English decoding with partially significant beta value (see Tables 5.31 and 5.32). Overall, only English measures explained the variability in English decoding within this older group of primary school children.

6.3.2.2 Examining the cross-linguistic influence of Hindi (in addition to English) on English decoding

Additional analyses, corresponding to those described above, were performed with the Hindi measures included in regressions along-side English measures in order to investigating potential additional contribution of Hindi processing areas on English decoding. The first regression analysis focused on the whole cohort of children; with results presented in Table 6.10.

Table 6.10: Hierarchical regression analysis to investigate the cross-linguistic influence of Hindi (in addition to English) on English decoding (All Grades)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Hindi
1	Gender, Grade and Age	.303	.303	F= 56.90 P< .001	Gender Age Grade		
A2	Phonological Processing	.537	.234	F= 98.58 P< .001	Deletion	.193**	.287**
A3	Orthographic Knowledge	.612	.075	F= 37.63 P< .001	Word chains	.198**	.139*
B2	Orthographic Knowledge	.494	.192	F=74.05 P< .001			
B3	Phonological Processing	.612	.117	F=58.76 P< .001			
4	Speed of Processing	.624	.013	F=6.55 P<.001	RAN objects	-.115**	-.038
5	Listening comprehension	.625	.001	F=.396 P=.674	Listening comprehension	.034	.000

*p < .05 **p < .01

Consistent with the whole cohort analyses including Punjabi measures (in Table 6.7), when Hindi measures (in Table 6.10) were including in the analyses of English decoding they also explained unique variance in addition to that accounted for English measures. This contribution to English decoding was with the significant beta weights for Hindi alongside English measures: both English and Hindi phonological processing showed significant beta values, as did orthographic knowledge (Hindi words chain measure was significant at 0.05 level of confidence), rapid naming in English showed a significant beta value (consistent with Study 1, see Table 5.30). Overall these findings suggested that the processing areas of phonological processing, orthographic knowledge and rapid naming, which were consistent with the Study 1 and the Hindi measures also explained variance to their English counterparts, which indicated the influence of Hindi language to acquire the English decoding.

Finally, to investigate this influence across the grades, the similar analyses were performed on younger grades (2 and 3) and older grades (4 and 5). The results from these are presented in Tables 6.11 & 6.12 below.

Table 6.11: Hierarchical regression analysis to investigate the cross-linguistic influence of Hindi (in addition to English) on English decoding for younger group (Grades 2 and 3)

	Variables	R ²	R ² Change	Significance R ² Change	Final Beta	
					English	Hindi
1	Gender, Grade and Age	.071	.071	F= 4.99 P< .001	Gender Age Grade	.064 -.015 -.024
A2	Phonological Processing	.476	.406	F= 75.57 P< .001	Deletion	.152* .310**
A3	Orthographic Knowledge	.582	.105	F= 24.27 P< .001	Word chains	.282** .114*
B2	Orthographic Knowledge	.438	.368	F=63.78 P< .001		
B3	Phonological Processing	.582	.143	F=33.09 P< .001		
4	Speed of Processing	.594	.012	F=2.85 P= 0.61	RAN objects	-.106* -.048
5	Listening comprehension	.596	.003	F=.627 P=.535	Listening comprehension	-.063 .015

*p < .05 **p < .01

Table 6.12: Hierarchical regression analyses to investigate the cross-linguistic influence of Hindi (in addition to English) on English decoding for older group (Grades 4 and 5)

	Variables	R ²	R ² Change	Significance R ² Change		Final Beta	
						English	Hindi
1	Gender, Grade and Age	.050	.050	F= 3.37 P< .001	Gender Age Grade		
A2	Phonological Processing	.338	.288	F= 41.24 P< .001	Deletion	.185**	.280**
A3	Orthographic Knowledge	.429	.092	F= 15.08 P< .001	Word chains	.134	.148
B2	Orthographic Knowledge	.263	.213	F=27.50 P< .001			
B3	Phonological Processing	.429	.166	F=27.31 P< .001			
4	Speed of Processing	.458	.029	F=4.99 P<.001	RAN objects	-.176**	-.042
5	Listening comprehension	.467	.008	F=1.46 P=.235	Listening comprehension	.099	-.003

*p < .05 **p < .01

The results for the younger group (Grades 2 and 3, presented in Table 6.11) assessing the effect of adding Hindi measures as potential additional variability in English decoding were very similar to the corresponding analyses involving the Hindi measures whole cohort analyses (see Table 6.10) and Punjabi measure analysis for grades 2 and 3 (see Table 6.8). However, in Punjabi measure analyses for younger group (Grades 2 and 3) orthographic knowledge did not showed any significance, but for Hindi analyses for English decoding younger group (Grades 2 and 3) showed partially significant beta values (consistent with Table 6.10), which was in contrast to Study 1 (see Table 5.31), listening comprehension (both English and Hindi) also did not show any variability (in contrast to Study1) but similar to whole cohort analysis (Table 6.10).

The older group (Grades 4 and 5) both English and Hindi phonological processing and speed of processing in English explained variability in English decoding with significant beta values. However, these results were in contrast to the corresponding analysis with Punjabi measures (Table 6.9) and Hindi phonology predict variability in English decoding. Interestingly, English orthographic knowledge did not show a significant beta value (in contrast to Study 1, see Table 5.32), though combined with Hindi measure, orthographic knowledge did explain significant change in the variance predicted by the model (indicated by the significant R-square change value). Overall these findings suggest that Hindi phonology measure explained common variance to their English counter parts and also orthographic knowledge and speed of processing in English were potential predictors of English decoding.

6.4 Discussion

The primary objective of this study was to investigate the cross-linguistic influence of Punjabi/ Hindi reading on English reading skills on the bases of the multilingual English reading model developed in the previous chapter of this thesis (figure 5.3). For this, the same multilingual Punjabi speaking children (from Grades 2 to 5) were assessed with the measures of Punjabi, Hindi and English reading which proved to be reasonable indicator of Punjabi, Hindi and English reading in Study 1.

The results were consistent with the English reading model of multilingual Punjabi speaking children developed in Study 1, at initial stages of literacy development (Grades 2 and 3). English reading comprehension was predicted by English listening comprehension, English pseudo-word reading (decoding) (consistent with simple view of reading) and English RAN objects (speed of processing) measures (consistent with extended simple view of reading and component model of reading). Further English decoding was predicted by Punjabi, Hindi and

English deletion (phonological processing), English word chain (orthographic knowledge) and Punjabi and English RAN objects (speed of processing) measures. Punjabi and Hindi phonological processing and Punjabi speed of processing predicted the English decoding, over and above the contribution made by English measures, but Punjabi and Hindi did not show additional variance in English reading comprehension. It means that in lower grades English measures were the strong predictors of English reading comprehension, but Punjabi and Hindi phonological skills helped these multilingual children to develop their English decoding skills and fluency acquired in Punjabi also has influence on these skills.

However, the results from the older group (Grades 4 and 5) were diverged from English multilingual model of reading from Study 1, English reading comprehension predicted by Punjabi and Hindi listening comprehension, English pseudo word reading (decoding) and English RAN objects (speed of processing). Along with these predictors, the knowledge of Punjabi and Hindi orthography also essential for these multilingual children to understand the text that they read in English language. An interesting finding from the analyses of older group was that the both Punjabi and Hindi phonological processing had negative significant beta weights for the English reading comprehension, which indicated towards the possibility that the phonological skills of Punjabi and Hindi may have been associated with poorer scores in English reading comprehension. Further the English decoding was predicted by English and Hindi phonological, English orthographic and speed of processing skills.

Hindi phonological processing and English listening comprehension influenced English decoding. Tunmer & Chapman (2012) argued the influence of linguistics skills on decoding skills, they found that the vocabulary measures had influence on decoding skills among children, but in this finding listening comprehension of first language (Punjabi) influence the decoding skills of third language (English).

On the bases of above findings, the model of English reading was developed. Rationale to (presented in figure 6.1). This model support English reading model developed in Study 1 (figure 5.3), with some variations due to cross-linguistic effects. From these findings/model it can be concluded that at younger stage of acquiring reading comprehension skills, there was no evidence of cross-linguistic influences of Punjabi and Hindi on English reading comprehension. But phonological processing skills in Punjabi and Hindi, and speed of processing skills in Hindi predicted English decoding. In contrary, for expert readers listening comprehension and orthographic knowledge skills in Punjabi and Hindi helps to acquire English reading comprehension, but phonological processing in Punjabi and Hindi may be associated with poorer scores in English reading comprehension.

On the other hand, for the younger group (Grades 2 and 3), Punjabi and Hindi phonological processing, Hindi orthographic skills contributed to English decoding on over and above the English measures. The older group (Grades 4 and 5) children showed the influence of only Hindi phonological processing skills and English listening comprehension showed contribution to English decoding skills.

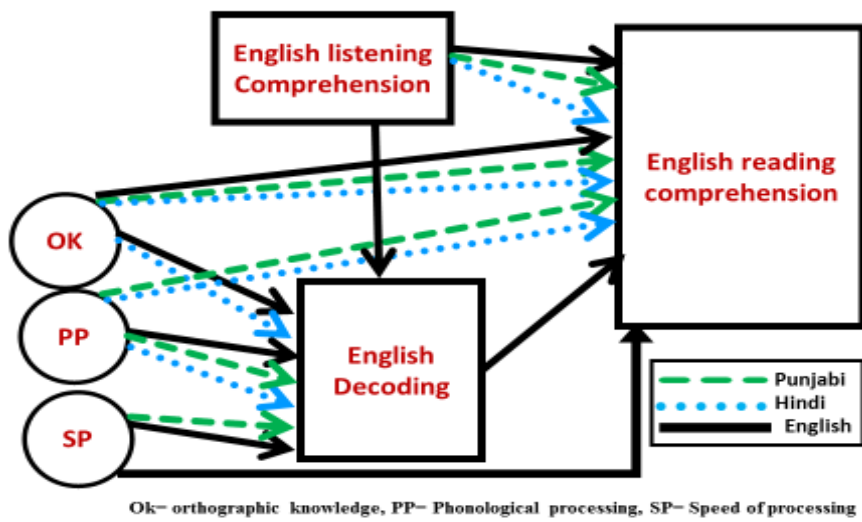


Figure 6.1: Multilingual (cross-linguistic) model of English reading

Chapter 7

General Discussion

7.1 Introduction

Over the past several decades, the assessment of cognitive linguistic skills among monolingual English children has been extensively investigated and discussed. In contrast, a limited amount of research has examined the cognitive linguistic skills of multilingual children; in particular, there is a paucity of research on Punjabi and Hindi orthographies. An understanding of the development of literacy skills, both within languages and across languages, by multilingual children learning to read in three orthographies: Punjabi, Hindi and English will provide teachers and curriculum and language policy developers with valuable information to support multilingual children. To increase understanding of multiliteracy development, the work in this thesis assessed a range of literacy-related skills involved in reading comprehension. This thesis contains two studies. Study 1 focused on developing separate within-language models of Punjabi, Hindi and English reading comprehension by testing a large number of multilingual children in the early stages of reading acquisition (Grades 2 to 5). In contrast, Study 2 focused on the influence of underlying Punjabi and Hindi cognitive-linguistic skills on English reading comprehension, thereby considering the potential effects of a first and second language reading skills on the development of English as an additional language within an educational context in which all three literacies are to be acquired in these early school years. The following sub-section summaries the findings from these two studies.

7.2 Summary of findings

The findings from Study 1 indicate that reading comprehension levels in Punjabi, Hindi and English was predicted by within-language measures of listening comprehension and word

decoding, with the latter being predicted by phonological, orthographic and speed of processing skills. However, orthographic skills showed a direct contribution to reading comprehension of all three languages; in Punjabi and Hindi, this was evident with younger (Grades 2 and 3) children, whereas in English it was more evident in older readers (Grades 4 and 5). In Punjabi and English, younger (Grades 2 and 3) readers' listening comprehension levels predicted their word decoding ability, independent of the other measures in the study. Additionally, for English, the phonological processing skills of older readers showed an independent contribution to reading comprehension. Speed of processing also predicted variability in English reading comprehension. These findings led to the development of Punjabi, Hindi and English models of reading comprehension, which will be discussed further in this chapter (Figures 5.1–5.3 are presented again below to aid discussion).

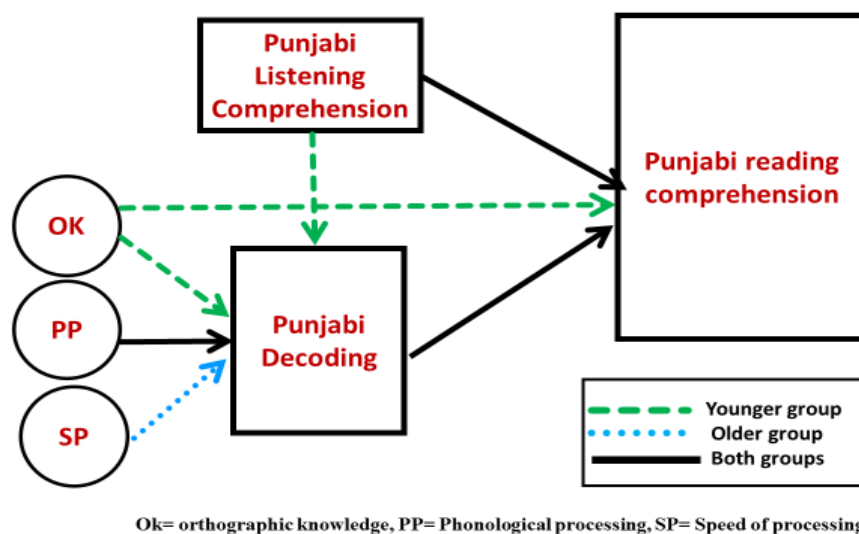


Figure 5.1. Multilingual Punjabi reading model.

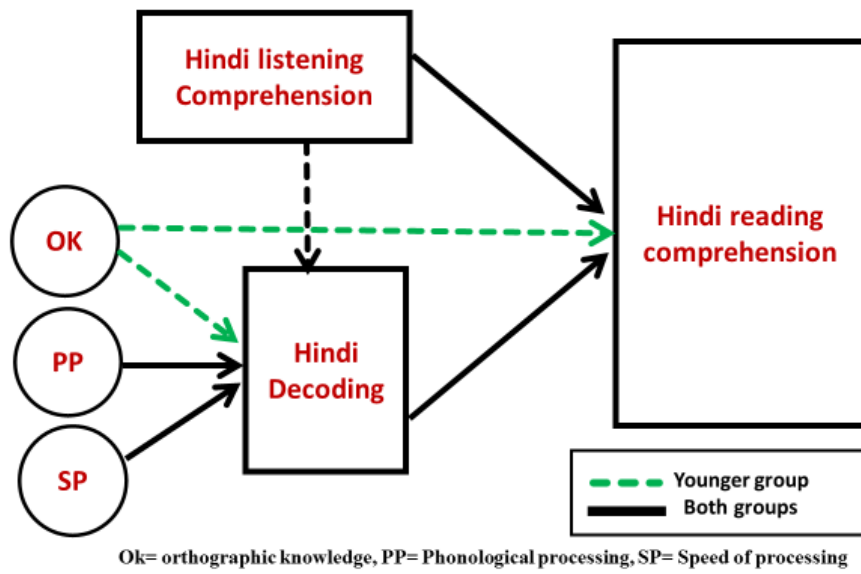


Figure 5.2. Multilingual Hindi reading model.

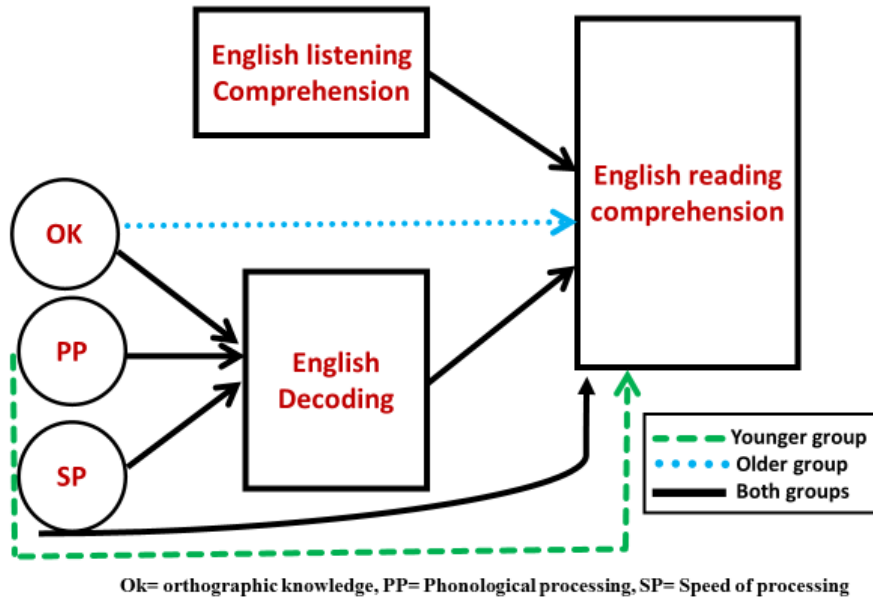


Figure 5.3. Multilingual English reading model.

The cross-linguistic influence of Punjabi and Hindi on English reading comprehension was investigated in Study 2, where the same multilingual primary school children were assessed on the measures selected from Study 1. The findings replicated the cognitive skills of Punjabi and Hindi, which influenced English reading comprehension. The findings from across grades indicate that the reading comprehension skills of younger (Grades 2 and 3) multilingual children were not influenced by Punjabi and Hindi processing skills. However, the measures of Punjabi (first language) and Hindi (second language) phonological processing, Hindi orthographic knowledge and Punjabi speed of processing influenced English decoding over and above the English measures among these younger readers. In contrast, the English reading comprehension skills of older (Grades 4 and 5) multilingual children were influenced by Punjabi and Hindi listening comprehension, phonological processing, and orthographic knowledge. However, for this group, only Hindi phonological processing showed a contribution to English decoding.

Study 2 also provided an opportunity to examine the model of English reading developed in Chapter 5 (see Figure 5.3). The findings replicated and extended the model proposed in Study 1 (see Figure 5.3) as a reasonable explanation of variability in English reading levels due to the cross-linguistic influence of Punjabi and Hindi reading skills. These interesting variations will be explained later in the discussion (Figure 6.1 is presented again below to aid discussion).

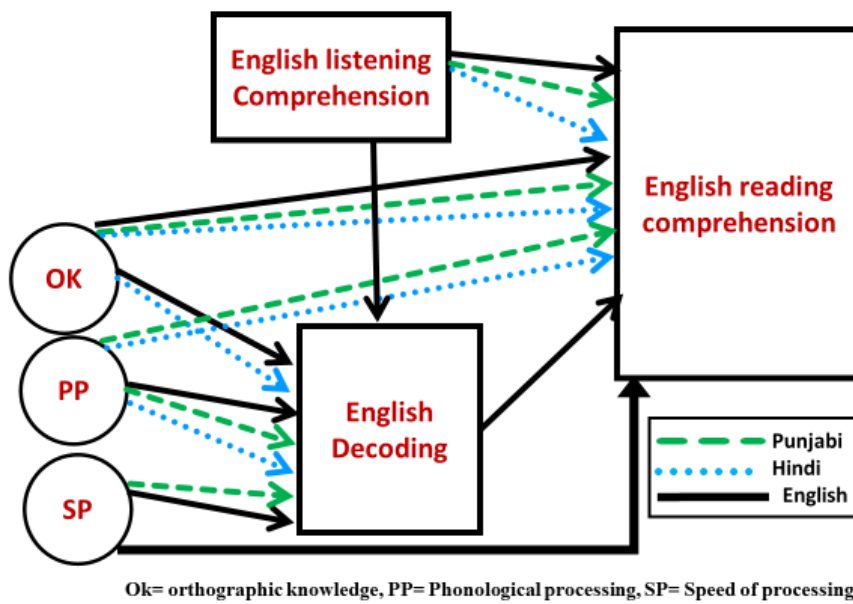


Figure 6.1. Multilingual (cross-linguistic) model of English reading.

This chapter begins with a brief review of the Punjabi, Hindi and English models of reading. This is followed by a discussion of the underlying cognitive skills needed for the development of Punjabi, Hindi and English reading comprehension. This discussion also considers how the research reported in this thesis has broader theoretical implications, such as moving towards a universal model of reading. The final section of this chapter presents the limitations of the study, along with directions for future research.

7.3 Theoretical implications of Punjabi, Hindi and English models of reading comprehension for multilingual children

7.3.1 Implication of the simple view of reading (SVR) model:

The simple view of reading (SVR) model was used as a framework for reading comprehension throughout this thesis. It has been derived from English language data, but the validity of such a model of reading must be tested across languages to confirm whether the components of the model are general or language specific (Florit & Cain, 2011; Kendeou,

Savage, & van den Broek, 2009). Many studies (2013(Kendeou et al., 2013; Sadeghi et al., 2016; Torppa et al., 2016) have been conducted in different languages to examine the SVR model in other orthographies. The findings of existing research can be used to examine the SVR model by giving understanding of the cognitive-linguistic skills of reading across three orthographies – Punjabi, Hindi and English – among multilingual children of the Punjab region of India. Punjabi, Hindi and English are all related, as they are in the same Indo-European language family. Punjabi and Hindi are derived from Brahmi script and have alphasyllabic features (Masica, 1993), while English uses an alphabetic orthography, based on Roman script (Ziegler & Goswami, 2006), and is reported to be an opaque orthography, with many inconsistencies and complexities (Share, 2008; Ziegler et al., 2010). These complexities of the English orthography have directed researchers to question English monolingual models and theories of reading English and argue for research in other orthographies(Ellis et al., 2004; Ziegler et al., 2010). Punjabi and Hindi are closely related: they are alphasyllabary, with a non-linear writing system, wherein dependent form of vowels is placed around consonants, making for a visually complex script. Based on the differences and similarities between Punjabi, Hindi and English, the implications for the SVR model are discussed.

The findings this thesis indicated that Punjabi, Hindi and English reading comprehension levels predicted by measures of listening comprehension and decoding. In addition, decoding was predicted by orthographic and phonological skills. Speed of processing also contributed to English reading comprehension, independent of decoding. These findings are consistent with predictions based on English language data. Orthographic knowledge was found to predict Punjabi, Hindi and English reading comprehension, which is different from what was predicted by English-language–derived models but similar to the models derived from other

languages (Sadeghi et al., 2016). The components of the model will be discussed in detail in the next section of this chapter.

7.3.1.1 Language-related skills

Tunmer and Chapman (2012) reported that oral language comprehension is a significant predictor of reading comprehension. Listening comprehension is commonly used to assess linguistic comprehension (Adlof et al., 2006; Hoover & Gough, 1990; Joshi & Aaron, 2000), which involves higher mental processes that defined the ability to acquire word-level information and extract sentence and discourse interpretations and can be assessed as the ability to answer questions about aurally presented text (Florit & Cain, 2011; Gough & Tunmer, 1986). Hence, in the current work, linguistic comprehension was assessed by measure of listening comprehension.

The findings of this research supported the importance of listening comprehension for successful Punjabi, Hindi and English reading comprehension. Listening comprehension, consistent with the SVR model derived from English monolingual data, explains the unique variance of reading comprehension across grades, even relatively early grades. This may be due to the children in the study being exposed to all three languages, starting from kindergarten. They may develop word recognition skills via their oral skills due to the teaching instruction techniques used in the classroom, which help to develop text comprehension ability. In the current research, the contribution of listening comprehension to decoding in all three languages (the findings are discussed in subsection 7.3.1.2) also support the above said idea that may be these multilingual children develop word reading through their listening skills from relatively early age. Hogan, Adlof, and Alonzo (2014) also suggested the importance of listening comprehension in early grades. They found that

children with a deficit in listening comprehension developed inadequate reading comprehension. Therefore, the findings from the current research can also help to diagnose reading problems early by assessing listening comprehension skills among these multilingual children. However, to decide between these interpretations (among multilingual readers), additional studies are required with other measures (e.g., vocabulary and syntactic knowledge) of linguistic skills.

Similarly, listening comprehension also predicted English reading comprehension in cross-linguistic analyses. Further discussion on these findings is given in Subsection 7.3.4; the purpose of mentioning these findings here is to report the validity of the listening comprehension component of the SVR model, not only within languages but also across the three different orthographies studied in the present research.

In summary, the present research reports the importance of listening comprehension skills within the SVR model, in both within and cross-linguistic analyses. The findings are consistent with the SVR model in regards to the importance of listening comprehension to reading comprehension among multilingual readers. The only difference found in this study is the reciprocity of the relationship between reading comprehension and listening comprehension.

7.3.1.2 Decoding: phonological and orthographic processing

Decoding is one of the constituents of reading comprehension, as outlined in the SVR model (Gough & Tunmer, 1986; Hoover & Gough, 1990), and it predicted Punjabi, Hindi and English reading comprehension in the data presented in this thesis. At an early age, decoding is dependent on grapheme–phoneme relationships and the phonological skills that support the development of these relationships. In addition, letter–sound knowledge also required to

consolidate orthographic presentations, which is required for automatization of silent word reading (Ehri, 2005). The decoding skills of the data presented in the current research were assessed by pseudo word reading ((Frost, Siegelman, Narkiss, & Afek, 2013; Georgiou, Papadopoulos, et al., 2012)t(Gough & Tunmer, 1986), which was considered to be an indicator of the grapheme–phoneme relationship. Phonological awareness and orthographic knowledge measures were also used to understand the development of these relationships and to examine the role of letter–sound knowledge in word recognition. Finally RAN of objects was used as an indicator of reading fluency. Overall, these measures (phonological processing, orthographic knowledge and speed of processing) explained the contribution to Punjabi, Hindi and English pseudo word reading across the grades tested.

The dual route(Coltheart, 1985, 2006) and triangle (Plaut et al., 1996) models of reading argue that there are two routes to word recognition: lexical and non-lexical. The current research showed that phonological processing, along with orthographic knowledge, significantly predict Punjabi and Hindi pseudo word reading, which means that in Punjabi and Hindi word reading, the readers use their orthographic representation of the word (lexical route), activating its meaning with knowledge of grapheme–phoneme rules (non-lexical route). Such findings are similar to findings from English research, which highlighted the significant role of orthographic skills in English word recognition (Coltheart, 2006; Georgiou, Papadopoulos, et al., 2012), which is already considered to be a complex orthography (Share, 2008). However, studies in Hindi, and especially Punjabi, are rare. Gupta and Jamal (2007) studied Hindi and English bilingual normal and dyslexic readers (Grade 3), and the results revealed that in Hindi, both groups followed the sublexical route for processing words, whereas in English, both groups used a combination of lexical and sublexical routes. However, this study was limited to 60 third grade children and used a limited number of

measures. The contribution of orthographic skills by younger readers in the present study to Punjabi and Hindi word recognition suggests complexity in the Punjabi and Hindi orthographies.

However, there is debate regarding the underlying processes involved in reading in different orthographies. It is argued that these processes depend on the depth of the orthography, which means that readers of shallow orthographies should depend on grapheme–phoneme correspondence rules due to consistency of the orthography (Goswami, Ziegler, & Richardson, 2005), whereas readers of opaque orthographies will rely more on grapheme-based representations of words in their word-recognition system (Wimmer & Goswami, 1994). The contribution of phonological awareness in Punjabi and Hindi decoding at an early stage of acquiring literacy indicated one-to-one mapping of written symbols and their sounds. In Punjabi and Hindi, the smallest unit of speaking is the consonant and the inherent vowel. The majority of CV (C = consonant, V = vowel) symbols map to their corresponding spoken CV syllables, thus there is one-to-one mapping of orthographic syllables and phonological syllables. Many other inconsistencies cannot be ignored, for example, CV syllables (the basic unit of phonology, /Cə/, i.e., consonant and inherent vowel schwa) in the word’s medial and final positions have schwa deletion (see Chapter 3 for details). Sircar and Nag (2013) conducted a survey on grade 3 and 4 Bengali-speaking children, and the results support the findings of the present research; these children produced the non-words correctly, even with the inconsistencies in the symbol-to-sound relationships. Researchers also found that the influence of the visual–spatial arrangement of the Bengali akshara on phonological processing is not straightforward; it varies with the proficiency of the readers and their phases of literacy acquisition.

The present findings indicated that younger readers of Punjabi and Hindi rely on both phonological and orthographic skills to support decoding of words, but for older readers, phonological skills seem to be more important as a predictor of variability in reading. Nag (2007) reported that in the Kannada language, there is an opposite pattern between acquiring orthographic knowledge and phonological sensitivity awareness. At the phase of acquiring the consonants with inherent vowel schwa the learners do not have a clear visual–spatial distinction between the consonant–vowel components; they may simply acquire the clusters of akshara as a representation of syllable sounds. At later stages, when the children gather knowledge about the CV and consonant clusters with ligature rules, they acquire more sensitivity to the sub-syllabic structure of the word. That is why in alphasyllabic languages, phonological processing is slow and takes many years to get expertise in, but orthographic knowledge is also required at the initial stage of literacy acquisition to understand the grapheme–phoneme relationships, which provides the basis for word recognition.

The cross-linguistic analyses (from the same data) reported in this research showed that English reading comprehension is predicted only by measure of English decoding, which is similar to the English multilingual model developed in Study 1 (see Figure 5.3). However, Punjabi and Hindi phonology, Hindi orthography, and Punjabi speed of processing influenced English decoding. The cross-linguistic analyses predicted that the phonological skills acquired in Punjabi and Hindi also significantly contribute to developing English decoding at an early age; phonological skills and orthographic skills in Hindi, and speed of processing in Punjabi also has contribution on over and above the English measures. On the other hand, among older readers, only Hindi phonology influenced English decoding. This may be due to the influence of Punjabi and Hindi phonology and orthography; the processing of English decoding is slow and predicted English reading comprehension up to the higher grades.

Similar results from within languages and the cross-linguistic English reading model also strengthen the above view. An alternate explanation may be that there are similar teaching methods for English, Punjabi and Hindi. Further research can help to understand these relationships among multilingual readers. The purpose for reporting these cross-linguistic influences is to argue the contribution of the decoding component of the SVR model to the cross-linguistic model of English. Further discussion of these cross-linguistic findings is explained in Subsection 7.3.4.

The contribution of phonological processing indicates that the consistency of Punjabi and Hindi is similar to other mixed orthographies, such as Persian (Sadeghi et al., 2016), and suggests that these children can trust their phonological skills to sound out non-words through their letter sound knowledge. The inclusion of fluency as the main measure of decoding skills is also consistent with work on relatively consistent orthographies (Joshi & Aaron, 2000). At the same time, the contribution of orthography knowledge at the initial stage of acquiring reading skills argues for the complexity of Punjabi and Hindi orthographies. Some researchers (Gupta, 2004; Vaid & Gupta, 2002) have argued that inconsistencies in Hindi orthography and studies in Punjabi orthography are very rare, but Punjabi and Hindi have many similarities (Gill & Gleason, 1969) (see Chapter 3 for more detail). From these findings, it can be concluded that Punjabi and Hindi are consistent orthographies at the initial stage; when the readers acquire consonant knowledge with inherent vowel schwa and as they start to learn CV with clusters and ligatures, the challenge of acquiring reading skills increases. These challenges prove that these orthographies are complex. Another reason may be the classroom teaching strategies that teachers use to teach all three orthographies, which was not considered in the present research.

Overall, in the Punjabi, Hindi and English cross-linguistic English model of reading, decoding is the main predictor for reading comprehension, which is similar to the SVR model. The only difference found in the study was the reciprocity in the relationship between listening comprehension and decoding. Decoding played an important role, even for older readers. The reason for this may be the dual nature (syllabic as well as alphabetic) of Punjabi and Hindi, which also influence reading in English. Nag (2011) and Nakamura, Koda, and Joshi (2014) studied alphasyllabic orthographies and argued that, due to the dual nature (syllabic as well as alphabetic) of word recognition, alphasyllabic orthographies played an important role in the acquisition of a higher level of literacy. Along with these findings, the contribution of phonology, orthography and speed of processing is worthy of further investigation.

7.3.1.3 Speed of processing

Speed of processing also plays an important role in reading, not only in English but also in different orthographies. Speed of processing is usually assessed by Rapid Automated Naming (RAN), which measures the speed with which participants can name a sequence of visually presented familiar stimuli, such as colours, digits, objects, and letters; however, there is debate in the literature as to the assessment measure of speed of processing. Some researchers consider that naming speed is part of phonological processing (Wagner et al., 1993) whereas others consider it to be an indicator of general processing speed of the cognitive system (Cronin & Carver, 1998; Georgiou et al., 2016). Wimmer et al. (2000) suggested that speed may be more important for word-level processing than reading accuracy in consistent orthographies; speed in this case is a good measure of word-decoding fluency. Similarly, many studies show a strong correlation between speed and reading comprehension,

which indicates that the speed of reading a single word predicts success in reading comprehension performance (Georgiou et al., 2016).

In the research reported here, speed of processing showed evidence of growing as a predictor of reading comprehension level in English, but this trend was not evident in Punjabi and Hindi findings, where speed of processing seemed to show no direct influence on comprehension levels. The findings from English (both within languages and across languages) are similar to the component model of reading (CMR) (Joshi & Aaron, 2000), which suggests that speed is an additive component in reading comprehension (the proposed formula is $R = D \times C + S$) and can explain variance in reading comprehension, as children are more expert in decoding printed words as fast as naming the letters. However, in Punjabi, Hindi and English, speed of processing influenced word-decoding skills. These findings suggest that when the decoding process is slow or laborious in consistent orthographies, its adverse effect on reading comprehension cannot be denied. Overall, speed of processing may be considered as a constituent of word-decoding skills, which supports cognitive resources to support higher-level functions that are important for reading comprehension (such as integration, inferences, comprehension monitoring, etc.). Further research is needed to determine the effect of speed of processing on reading among multilingual children.

7.3.2 Importance of orthographic knowledge

In this thesis, the contribution of orthographic skills within languages—Punjabi, Hindi and English—and the cross-linguistic influence of Punjabi and Hindi on English reading skills were assessed. Orthographic knowledge refers to both the knowledge of letter to sound correspondence rules and mental representation of written words from mental lexicon (Apel, 2011; Sadeghi, 2013).

The findings reported in this thesis suggest that orthographic knowledge is a good predictor of decoding and reading comprehension. The findings of decoding were discussed in Section 7.3.2. The findings also indicated the contribution of orthographic knowledge (for older readers) in English reading comprehension. Punjabi and Hindi orthographic knowledge also contributed to Punjabi and Hindi reading comprehension, but this contribution is from an earlier age as compared to English reading. This indicates that readers may rely on their orthographic knowledge to comprehend written text beyond what can be explained by decoding skills. Punjabi and Hindi are languages with a non-linear writing system, so at the initial stage, readers need to recognise many symbols, which increases the complexity of these orthographies (see Chapter 3 for more details). These potential complexities may be the reason for the contribution of orthographic knowledge (Nag, 2011; Stanovich, 2000). The complex features of the orthographies may lead to the assumption that the text-reading experience, and the skills associated with text understanding, may improve orthographic knowledge as much as orthographic skills support reading acquisition.

These findings further support the idea that the written form of a language goes beyond simple phoneme–grapheme representation (i.e., spelling of the phoneme) (Perfetti & Harris, 2013), which indicated an obvious link between the lexical processes and comprehension. Perfetti (2007) described this link as “the most direct at level of short runs of text, a sentence or two, where one can observe word processing ‘on-line’ as part of text reading”. Thus, it can be assumed that orthographic knowledge may integrate the word currently being read into the ongoing representation of the text, which can enhance reading comprehension. However, these findings lead one to ask whether this link activates semantics or fast word recognition, which supports the cognitive resources for higher level text comprehension.

In cross-linguistic analyses, both Punjabi and Hindi orthographic skills influence English reading comprehension among expert readers. In the present findings, the contribution of orthographic knowledge is similar to international findings (Commissaire, Duncan, & Casalis, 2011; Sun-Alperin & Wang, 2011). This gain, or positive transfer, may be due to these multilingual children having access to two orthographic systems (Punjabi and Hindi) while acquiring reading skills in English; it may also be due to the instruction strategies used (which was not considered in the present research). The overall findings suggest the inconsistency/complexity of Punjabi and Hindi orthographies. However, these results require further research to better understand this unique contribution of orthographic knowledge.

7.3.3. Role of listening comprehension in decoding

In the present research, Punjabi and Hindi listening comprehension showed a direct contribution to decoding. In Punjabi, this contribution is by a younger group, but in Hindi, no contribution was observed for any age group. Even in English decoding, there was a contribution from listening comprehension among younger readers, but this contribution was partial (see Chapter 5 for detail). (Hoover & Gough, 1990) claimed that the two components of the SVR model (i.e., decoding and linguistic comprehension) are separate and independent of each other. Tunmer and Chapman (2012) suggested that the contributions of oral language comprehension and word decoding are not independent; they found that the vocabulary component of oral language comprehension contributed the variance in decoding (and vice versa). Wagner et al. (2015) analysed Tunmer and Chapman's data analyses method and found that when the data is correctly specified, listening comprehension affects decoding, which also provide similar good fits to the data in their study. Wagner et al. (2015) also pointed out the contribution of decoding linguistic comprehension, which is not considered in the current research but may be an interesting direction for future research. One explanation

is that multilingual children develop their word-decoding skills with the help of their oral skills (as discussed in Section 7.3.2.1). This may be due to the teaching instructions used in school for younger learners depending more upon oral practice, which helps to develop word-decoding skills; later it provides a base for reading comprehension in Punjabi and Hindi, both directly through verbal skills and indirectly through word recognition. The second explanation may be due to the dual nature of the Punjabi and Hindi orthographies, which present the initial recognition of letters both at the phoneme as well as the syllable levels. Due to the nature of Punjabi and Hindi, these children acquire basic language knowledge by reciting each consonant again and again, which improves their listening skills and later influences their word-reading skills.

However, in cross-linguistic analyses, English listening comprehension also contributed to English decoding, but only among the older group. This may be due to the influence of Punjabi because this contribution was found when Punjabi measures were entered into the regression model after entering the English measures. This may be due to the teaching instruction in English being similar to Punjabi (based on oral drilling), which influences English reading comprehension. This may be the reason why, in cross-linguistic analyses among older readers, Punjabi and Hindi affect English reading comprehension and English listening comprehension affects English reading comprehension indirectly through English word decoding. However, the role of listening comprehension in decoding is worthy of further investigation.

7.3.4 Cross-linguistic influence of Punjabi and Hindi reading skills on English reading comprehension

The present study found transfers of Punjabi phonology, Hindi phonology and Hindi orthography to English decoding on over and above the English measures; no influence of

Punjabi and Hindi reading skills on English reading comprehension was recorded among young readers (Grades 2 and 3). In contrast, the older group (Grades 4 and 5) showed the influence of Punjabi and Hindi listening comprehension, phonological processing and orthographic knowledge on English reading comprehension. It is clear from the findings that at younger levels, Punjabi and Hindi influenced English decoding, but this transfer shifts to English reading comprehension as these multilinguals gain expertise in word recognition. In the literature, transfer from L1 and L2 to L3 was found to be restricted at an early age (Hammarberg et al., 2009) but the findings from younger multilingual readers in the present research indicate that this may be restricted to reading comprehension and not to the word recognition.

Leikin et al. (2010), conducted a study on bilingual and monolingual young children, and bilingual children showed superiority on all measures of Hebrew (L2). Early exposure to Russian (L1) was found to have a positive effect on meta-linguistic development of Hebrew (L2) decoding for L1 and L2. These results are similar to the present research, in which multilingual children showed a positive transfer of not only Punjabi and Hindi phonology but also Hindi orthography to English decoding. The transfer of phonological processing is similar to other findings (Gut, 2010; Leikin et al., 2010), which suggest that understanding of grapheme–phoneme structure and even explicit distinction between Punjabi, Hindi and English support word recognition in English. Specifically, when both Punjabi and Hindi are alphasyllabic and have features of both syllabic and alphabetic languages, the alphabetic features may help to develop English decoding at the initial stage of language acquisition. These features also play an important role in English decoding even at higher grades through Hindi orthography. Talebi (2013), supported the transfer of reading skills of L2 to L3. The contribution of Hindi phonological processing and Hindi orthography to English decoding

among older children also supports the idea that L2 can contribute to L3 reading comprehension from grades 4 and 5. Previous studies have tested these influences but they only considered two languages (L1 and L2) where the skills developed in the first language showed cross-linguistic contribution to word reading in the second language (Leikin et al., 2010; Saiegh-Haddad & Geva, 2010). Some studies on multilingual children considered the benefits bilingual students have when learning a new language (Abu-Rabia & Sanitsky, 2010; Haenni Hoti et al., 2011). All these findings support the interconnection model given by Cook (2003), which explains that the separate components of languages interact with one another. Future research is required to explore these influences.

In cross-linguistic analyses of English reading comprehension, Punjabi and Hindi listening comprehension skills seemed to be more predictive of English listening comprehension among the older group than the younger group. This transfer was also supported by Edele and Stanat (2016) who argued that the transfer should be more pronounced with a higher level of L1 proficiency. This means that oral proficiency in Punjabi and Hindi does not affect English reading comprehension; if the readers are not proficient in Punjabi and Hindi listening skills once they get the expertise, then the listening skills acquired in Punjabi and Hindi help them to attain verbal skills in English reading comprehension. These findings support Cook's (2003) interconnection model for English reading comprehension, which means that L1 (Punjabi) as well as L2 (Hindi) listening comprehension enhance reading comprehension in L3 (English).

Cross-linguistically, orthographic knowledge in Punjabi and Hindi also enhance English reading comprehension; once these multilingual children attain the character knowledge and attain proficiency in word recognition in L1 (Punjabi) and L2 (Hindi), then the lexical processes attained in these two languages create a link between L1 and L2 for learning L3

(English). These findings can be explained in light of the interdependence hypothesis (Cummins, 1978) and the interconnection model (Cook, 2003), which suggest the advantage older learners (Grades 4 and 5) have in applying L1 skills to L2 acquisition. This means that L1 and L2 proficiency are interdependent because both are a result of the same underlying cognitive proficiency. Abu-Rabia and Siegel (2003) also supported these findings in their study on trilingual Arabi–Hebrew–English-speaking Arab students. The results support the positive consequences of developing reading and oral skills in L3. Despite these studies, research on the transfer from L1 and L2 to L3, and especially the transfer of orthographic knowledge, is rare. To understand its cross-linguistic role from Punjabi and Hindi to English, further research is required.

The most interesting finding from cross-linguistic analyses was the transfer of phonological processing of Punjabi and Hindi to English reading comprehension. In regression analyses, the beta weights were significant, but with negative values, meaning that Punjabi and Hindi phonological processing can impact the English reading comprehension adversely. These findings may point to transfer of spoken language skills in reading text in English. Which can reduce the capability to attain the proficiency in English text reading, even after having the positive influence of Punjabi and Hindi listening comprehension and orthographic knowledge on English reading comprehension. Different types of cross-linguistic factors may restrict positive transfer from the first and second languages to the third language. For example, Ringbom (2001), argued that the native L1 language can cause incorrect pronunciation and usage of English (L2) words with a non-native semantic extension, which can be the main reason for the negative transfer from L1. So, this may be due to the nature of Punjabi and Hindi phonology (at the syllable level), which is different from English, and thus it affects English reading comprehension adversely. The second explanation is due to the complexity

of Punjabi and Hindi syllables at higher grades; the knowledge of CV and consonant clusters with many ligature rules may increase sensitivity to the sub-syllabic structure of the word (Nag, 2007). These complexities of Punjabi and Hindi interfere with comprehension of the text in English. Future research with more sensitive phonological measures such as syllable deletion or substitution is required to look into this very interesting issue; it will give a better understanding of these findings and the role of phonological processing across languages.

The main reason for linguistic transfer of reading skills across languages may be the teaching instruction in Punjabi, Hindi and English languages and the competency of the teachers, especially when English is not the teacher's native language. In the present research, the teaching methods used were not considered. In the literature, few studies exist on multiliteracy, but rare studies or no study on multilingual children from Punjab region of India, so there is a crucial need for further research on Punjabi and Hindi languages. The current research provides a base for understand Punjabi and Hindi as native languages and English as a non-native language.

7.4 Practical implications of the findings and the Punjabi, Hindi and English model of reading comprehension

7.4.1 Implications for teaching practice

The findings of the current research have important implications for teaching practice. The developed models suggest potential predictors of reading comprehension, which emphasize the importance of phonological skills, orthographic skills and linguistic skills in Punjabi, Hindi and English reading development among multilingual children (from a young age). These findings also highlight the link between phonological and orthographic skills and the influence of this link on attaining reading skills. Teaching these links (both within and across languages) within a normal classroom setting should lead to better reading acquisition among

multilingual children. These findings can help to provide a strong base for future intervention-based research, which also can confirm these interpretations.

The findings relating to the relationship between spoken and written Punjabi, Hindi and English also argue for the need to teach the link between written and spoken form directly, because this can go beyond the level of phonemes and graphemes and can be used to consider the connection between listening comprehension and reading comprehension. As an example, further research that examines whether teaching inference skills in listening comprehension can increase inference skills in reading comprehension would be interesting and may reveal the need to use comprehension skills to support word recognition in Punjabi, Hindi and English text reading.

Findings from this cross-linguistic study showed that the influence of Punjabi and Hindi listening comprehension, phonological skills and orthographic skills on developing reading skills in English, children who have high orthographic skills and listening skills in Punjabi and Hindi may aid in acquiring reading skills in English. The findings may also inform work on third-language acquisition by considering the commonalities, differences and similarities of the three languages (Punjabi, Hindi and English), which can help improve literacy in second, third, or additional languages. Overall, the findings from both studies—within languages and across languages—should support the use of appropriate methods and teaching instructions across three learning contexts. Furthermore, it is evident from the findings that listening comprehension influences reading comprehension skills of multilingual children, which suggests that a teaching environment where children get more exposure to language, such as in storytelling groups and book clubs where children are exposed to oral language, should enhance reading skills.

In the current research, a persistent challenge was observed in the evaluation of reading outcomes, particularly from state education board schools. To determine the reasons for a slow pace of mastery, the role of reading instruction must be determined for all three orthographies. Thus, the approach to reading instruction is another area of interest for the future research. The findings from the current research will be helpful for teachers, curriculum developers and policy framers; consideration of these findings should help improve literacy development among multilingual children.

7.4.2 Assessment tools

The Punjabi, Hindi and English models within languages (Figures 5.1–5.3) and across languages (Figure 5.4) suggest a number of underlying cognitive skills as predictors of Punjabi, Hindi and English reading comprehension with the two main components of the SVR model discussed throughout this thesis. As suggested by the findings reported in Study 1 and Study 2, both components of the model—linguistic comprehension and decoding—are required for successful reading in all three languages and may also be needed to identify different types of reading problems. Similarly, to identify the reading success and problems at the word recognition level, measurement of phonological and orthographic skills is also required, as suggested in Study 1 and Study 2. There is a lack of assessment tools in Punjabi and Hindi that are specifically targeted at reading comprehension skills. However, the assessment tools available in English are standardized for monolingual children and require modification to a cultural context and the needs of these multilingual children. Formal standardisation of measures developed in this study across different areas of Punjab (measures in all three languages) and other parts of India (especially Hindi and English measures) would provide a comprehensive assessment procedure in Punjabi, Hindi and English languages, which should also inform the assessment of those who are outside of India

(migrants), with appropriate modification as per the learning context (e.g. multiliteracy) and local dialect.

The measure of phonological awareness may need to be considered carefully in future research. In the present research, the measure of deletion and substitution in Punjabi and Hindi was developed by deleting or substituting the Cə, (C is the consonant and ə is schwa), vowels, vowel diacritics and consonants (see Chapter 4 for detail), due to the alphasyllabic nature of both languages. Further research with the addition of syllable deletion or substitution measures in the assessment battery will help to understand the relationship of Punjabi and Hindi phonological awareness (both within and across languages) with English reading comprehension among multilingual children. In addition, the findings from the cross-linguistic study indicate that the reading skills acquired in the first and second language can influence the acquisition of literacy as well as identify literacy deficits in the third language. Measures of listening comprehension, orthography and phonology in Punjabi and Hindi can assess the improvement or deficit in English reading comprehension. Hence, as with other studies, measures in the first or second language may be better identifiers of literacy or low literacy levels in the third language amongst young multilingual children of the Punjab region of India.

7.5 Limitations and direction for future research

Every study has limitations that give directions for future research. The results from this research must be considered and interpreted within the context of several limitations. The present research was limited to only multilingual children from the Punjab region. In India, there are many other alphasyllabic languages (known as Akshara orthographies), with similarities and differences between spoken and written forms, such as Hindi and Punjabi. Therefore, these are the areas in need of further research to determine the influence of

different skills on reading acquisition in other Indian languages. In the last decade, there has been a growing body of research suggesting that linguistic comprehension can influence decoding. This would mean that linguistic competence can directly influence reading comprehension and also indirectly through decoding (Kendeou et al., 2013; Kendeou et al., 2009; Sadeghi, 2013; Tunmer & Chapman, 2012). This can also be seen in the findings of the current study, but in the present study, only listening comprehension was used to assess linguistic comprehension skills. To look into the relationship between other oral skills and both decoding and reading comprehension of Punjabi, Hindi and English, further research is required with other measures (e.g. vocabulary or syntactic knowledge) of linguistic comprehension.

Punjabi and Hindi are considered relatively regular languages, with a one-to one letter-to-sound relationship; simultaneously, the written symbols present the sounds at the level of both phoneme and syllable (Nag et al., 2011). Due to these features, it is hard to understand what is regular and what is not, even in literature; there is not much clarity about these regularities and irregularities of both orthographies. However, the present research pointed some of these irregularities. Further research into Punjabi and Hindi morphology and visual-spatial processing is appropriate to know more about these regularities and irregularities and develop curricula and teaching strategies as per the need of multilingual readers. Mishra, Pandey, and Srinivasan (2011) suggested that working memory also plays an important role in sentence processing of Hindi; new studies are required in Hindi as well as Punjabi.

There are also several limitations to consider within the assessment battery and sample. The lack of access to standardized measures (as reported in Chapter 4), points out the need to develop measures for different aspects of the reading process, both in the assessment of reading comprehension and other component skills of reading. Although the procedure used

to develop measures proved to be reliable for the purpose of this thesis, further research could address this limitation, following the standardization of the assessment battery developed for the present research. Furthermore, the sample was selected from primary-school-aged multilingual children for whom there were no known or recorded learning difficulties (as per school record). Further research is required on multilingual children with reading difficulties. There are a few studies (Gupta, 2004; Gupta & Jamal, 2007) on bilingual (Hindi and English) dyslexic children, but more research is required on other cognitive skills and disabilities hypothesized to be involved in the reading process. The sample size for the studies reported in this thesis was relatively large, but a greater sample size would have provided additional power when carrying out analyses; increased sample size also allows for findings in broader populations with greater confidence. As an example, the sample for the current study was collected from two schools; future replication of the studies reported in this thesis with a large sample from different types of schools will allow for these limitations to be addressed, and future studies with a large sample from different types of schools will help to examine the current findings. The cohort of multilingual participants reported in this research learned Punjabi as their mother tongue, Hindi as a national language, and English as an additional language. In the present research, overall academic achievement was considered while selecting the sample, but for the depth of understanding of reading skills of English as an additional language, further research is required; while selecting the sample, the participant's level of English language competence should be considered.

Research in Punjabi and Hindi is quite new, so future research in these languages is required. Three models of Punjabi, Hindi and English reading of multilingual children were discussed in this research. Along with the variables investigated through these models, further potential influences, such as morpho-syntactic awareness, working memory, home language, interest

and motivation to learn reading and pedagogical technicians can be examined. Overall, the proposed additions should provide a basis for further work to increase our understanding of Punjabi, Hindi and English reading skills, which should provide a basis for cross-language theories.

7.6 Conclusion

The current work focussed on predictors (both within and across languages) of reading in two alphasyllabic orthographies (Punjabi and Hindi) and one alphabetic orthography (English). For all, reading comprehension was predicted by listening comprehension and decoding, which is consistent with the SVR model. However, orthographic knowledge was an independent predictor of reading comprehension, indicating the important influence of this area of processing. Commonalities between predictors, however, also argue for cross-language influences of basic processes within multilingual children, which may need to be considered in future studies within an Indian linguistic context. Overall, the findings argue that relative transparency, which has been associated with orthographies such as Punjabi and Hindi, needs to be considered in light of other challenges to reading acquisition, such as orthographic complexity, and it might be better to consider Punjabi and Hindi as more akin to other orthographies (such as Persian) that do not show all the features of transparency that might be expected based on the correspondence between written symbols and language sounds.

The cross-linguistic findings helped to develop the cross-linguistic multilingual model of English reading comprehension, which also supports the two main components of the SVR model and verified the English multilingual model developed in Study 1 of this thesis. This model showed that Punjabi and Hindi influenced English reading comprehension. These influences gave direction for future research, especially on the instruction strategies used in

the classrooms to teach Punjabi, Hindi and English. However, the models developed in the present study require further verification (due to the first study on reading comprehension skills involving in Punjabi and Hindi). Studies on other skills, such as motivation and interest, home environment, teaching instruction, etc. are required, as well as studies on additional potential influences, especially the reciprocal relationship between reading comprehension and orthographic processing in Punjabi and Hindi.

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Appendix A Co-Authorship Form

Deputy Vice-Chancellor's Office
Postgraduate Office



Co-Authorship Form

This form is to accompany the submission of any thesis that contains research reported in co-authored work that has been published, accepted for publication, or submitted for publication. A copy of this form should be included for each co-authored work that is included in the thesis. Completed forms should be included at the front (after the thesis abstract) of each copy of the thesis submitted for examination and library deposit.

Please indicate the chapter/section/pages of this thesis that are extracted from co-authored work and provide details of the publication or submission from the extract comes:

The submitted chapter is based on work presented in this thesis:

Results and tables of Chapter 5 (Study one: Predictors of reading comprehension of Punjabi, Hindi and English among multilingual readers); page number 93 to 143.

Material from Chapter 3 on the Punjabi and Hindi languages/orthographies); page number 53 to 69.

This manuscript has been submitted as a book chapter, but is still undergoing review by the editors of the book.

Gautam, S., Everatt, J., Sadeghi, A., & McNeill, B. (submitted). Multiliteracy in Akshara and Alphabetic Orthographies: The case of Punjabi, Hindi and English learners in primary schools in Punjab. In M. Joshi & C. McBride (Eds.), Handbook of Literacy in Akshara Orthographies.

Manuscript submitted for publication.

Please detail the nature and extent (%) of contribution by the candidate:

The chapter is based on research from the candidate's thesis as well as the candidate's knowledge of the languages/orthographies. The writing of the chapter was a joint effort by all authors, but based on material written by the candidate as part of the PhD thesis. Therefore, the candidate's contribution was about 30 to 40% of the material in the submitted chapter – it is now undergoing review by the editors and may require revisions following the review processes.

Certification by Co-authors:

If there is more than one co-author then a single co-author can sign on behalf of all

The undersigned certifies that:

- The above statement correctly reflects the nature and extent of the PhD candidate's contribution to this co-authored work
- In cases where the candidate was the lead author of the co-authored work he or she wrote the text

Name: Seema Gautam Signature: Date: 10/07/2017

Appendix B English Measures

Reading Comprehension

Student code.....

Grade.....

Read each passage carefully and choose the best answer for the questions given after each passage.

Practice Passage

My friend and I made a tree house. We like to hide in it. We climb up the rope and pull it up after us. Then no-one knows where we are. We play space-ships. At tea-time, we slide down fast and we are always first for tea.

Questions:

1. What would you say the best name for the story?
 - a) climbing up and down
 - b) Tree house
 - c) tea-time
 - d) race
2. Who built the house in the tree?
 - a) nobody
 - b) my parents
 - c) my dad and I
 - d) my friend and I
3. How did the boys/girls get up into the tree-house?
 - a) used a ladder
 - b) asked help from adults
 - c) climbed up a rope
 - d) climbed up the tree
4. How could the children's friends guess that they were playing up in the tree-house?
 - a) they couldn't
 - b) they had informed their friends
 - c) The rope was pulled up
 - d) The rope was pulled up
5. What game did the boys/girls play in the tree-house?
 - a) space ships
 - b) hide and seek
 - c) tag
 - d) paper, scissors, rock
6. How did the little boys/girls manage to be always first to eat?
 - a) they slid down the rope fast
 - b) they ran fast toward the house
 - c) they had a watch
 - d) they set an alarm clock

Puppy (Level 1)

A white mother dog came to my house. She put her puppy by the door. Then she went away. Now I have her baby for a pet.

1. What came to the little boy's/girl's house?
 - a) a black cat
 - b) a kitten
 - c) a white mother dog
 - d) a puppy
2. Where did she leave her puppy?
 - a) in the lounge
 - b) in the car
 - c) by the pool
 - d) by the door
3. What did she do then?
 - a) she stayed for dinner
 - b) she went away
 - c) she slept on the drive
 - d) she made noise.
4. What did the little boy/girl do with the puppy?
 - a) gave her some food
 - b) asked her to leave
 - c) took it to a pet shop
 - d) kept it for a pet

Surprise Parcel (Level 2)

A surprise parcel for Meenu and Surjit arrived on Saturday. Surjit looked at the strange stamps. Meenu undid the string. Then they shouted with delight. Uncle had sent a watch for Meenu and an electric train for Surjit. They were what the children had wanted for a long time.

1. On what day did the parcel arrive?
 - a) Saturday
 - b) Tuesday
 - c) Sunday
 - d) Thursday
2. How do you know that Meenu and Surjit were not expecting the parcel?
 - a) Because they shouted with delight
 - b) Because it had some stamps
 - c) Because it was a surprise parcel
 - d) Because there was string around the parcel
3. Who undid the string?
 - a) Meenu
 - b) Surjit
 - c) Meenu and Surjit
 - d) Their Uncle
4. How do you know that the parcel came from another country?
 - a) It had some strange stamps.
 - b) It had a string around it.
 - c) It was a present.
 - d) It was delivered by the post
5. Who had sent the parcel?
 - a) Meenu and Surjit's friends
 - b) Meenu and Surjit's parents
 - c) Meenu and Surjit's aunt
 - d) Meenu and Surjit's uncle
6. Why were the children so pleased to receive these presents?
 - a) Because it was a parcel with stamps.
 - b) Because they wanted their presents for a long time.
 - c) Because the parcel looked strange.
 - d) Because the sender loved them.

Circus (Level 3)

The lions' final act was in progress. Jack stood waiting to clear the ring. The thunder outside the circus tent had made them restless. Suddenly Tina the lion trainer stumbled. Her whip fell. The younger lion sprang towards her. Hack leaped swiftly inside the cage, cracking the whip with great skill. His prompt action enabled Tina to regain control quickly. After that brief adventure, Jack decided upon his future work.

1. Where did the story take place?
 - a) zoo
 - b) lions' cage
 - c) circus
 - d) jungle
2. Where the lions near the beginning, near the middle, or near the end of their act?
 - a) beginning
 - b) middle
 - c) end
 - d) All of the above
3. What was Jack waiting for?
 - a) to take the lions away
 - a) to find a way out
 - b) to bring the lions onto the stage
 - c) to clean the stage
4. Why were the lions restless?
 - a) they didn't like their trainer.
 - b) they didn't like the whip.
 - c) thunder frightened them.
 - d) Jack frightened them.
5. What happened to Tina?
 - a) She yelled for help.
 - b) She was in good control.
 - c) She stumbled.
 - d) She stuttered.
6. What did Jack do?
 - a) He watched.
 - b) He ran away.
 - c) He jumped toward the lion.
 - d) He saved Tina
7. Who finished the act?
 - a) Tina
 - b) Jack
 - c) The youngest lion
 - d) Nobody
8. What did Jack decide to after this adventure?
 - a) That he would be a lion tamer.
 - b) That he would never work with lions.
 - c) That he would always carry a whip.
 - d) That he would do nothing and watch.

Jan (Level 4)

Jan buckled on her diving belt of metal weights and dropped from the launch. Skipper David supervised her air-hose to prevent tangling. Peter, following the bubbles, guided the dinghy above the diver, as she searched the mysterious underwater world. Jan surfaced frequently clutching crayfish. The required number of specimen was almost obtained when the grey nurse shark advanced directly towards her. Jan retreated cautiously without signalling for assistance. The creature brushed by, ignoring her, as baby sharks emerged from some rocky grooves. Their welfare was more important to the shark than the diver's now motionless figure.

1. What equipment assisted Jan in her exploration under water?
 - a) Her courage and skills
 - b) Dinghy above her head
 - c) Diving belts and air hose
 - d) Her motionless figure
2. What did Skipper David do to help Jan?
 - a) Guided her through her expedition
 - b) Supervised her air-hose
 - c) Assisted her to get rid of the shark
 - d) Float above her head
3. How did Peter know where the diver was?
 - a) By watching the diver under the sea
 - b) By following the shark
 - c) By getting signals from the diver
 - d) By following the air bubbles
4. What do you think Jan was diving for?
 - a) For entertainment
 - b) For catching crayfish
 - c) For observing shark
 - d) For exploring under water life
5. Why did it seem that the shark might attack Jan?
 - a) It swam directly towards her.
 - b) Sharks usually attack humans.
 - c) It aimed at rescuing the baby sharks.
 - d) It was disturbed.
6. How did Jan avoid trouble with the shark?
 - a) Asked for help from Skipper
 - b) Fought with the shark
 - c) Pretended to be dead
 - d) . Kept still
7. What kind of a home protected the bay sharks from enemies?
 - a) Wreckage of ship
 - b) Rocky grooves
 - c) Under water plants
 - d) Shark house
8. Why was the shark not interested in Jan?
 - a) The shark was scared.
 - b) The shark thought Jan was dead
 - c) The shark was not interested in divers
 - d) The shark was worried about the baby sharks.

Listening comprehension

Hello, you will hear six passages in this part of the test. There are some questions, six or seven, after each passage. You should listen to each passage and the questions carefully. Then tick your answers on your answer sheet. Remember to tick the gray box on your answer sheet for a “YES” and the other box for a “NO” answer. You will hear the passages and the questions ONLY once. We will practice first.

Now listen to the practice story.

Practice Story: The Surprise

Shankar’s grandfather lived for away on a farm. The last time Shankar had seen his grandfather, he had promised to send Shankar a surprise. Shankar was excited because his mum said the surprise would arrive today. After breakfast, Shankar’s dad brought a big basket into the kitchen. Shankar heard a “meow” and saw a long, furry tail from inside the basket. Shankar was happy that he got just what he’ been waiting for.

Now you will hear two questions. Tick the correct answer on you answer sheet. Remember the gray box is for a “YES” answer. Make sure you tick the correct box.

Question 1) Did Shankar’s grandfather live with them?

Question 2) Was Shankar’s surprise a kitten?

Now READY?!

Now listen to the first story.

Story 1: A Lucky Kangaroo

The big, red kangaroo hopped slowly through the burned-out bush, sniffing the ground. The kangaroo's stomach growled now as he remembered eating his last meal of grass. That had been before he hopped past the river and fell asleep, exhausted. Yesterday, the lightning had come out of the sky, and the animals had to escape from the fire. The kangaroo was very hungry. Suddenly, he caught the faint smell of something familiar, could it be berries? The scent led the kangaroo to some shrubs near a fallen tree.

Now you will hear seven questions. Listen carefully and tick the correct box.

- Question 1) What happened to the bush – was it burned?
- Question 2) Did the kangaroo have a stomach-ache?
- Question 3) Was the kangaroo sniffing the ground for food?
- Question 4) Did the kangaroo have his grass meal before he hopped past the river?
- Question 5) Did the kangaroo fall asleep after he hopped past the river?
- Question 6) Did the kangaroo find some berries?
- Question 7) Do you think the kangaroo was going to eat the berries?

Now listen to the next story.

Story 2: The Reading Challenge

Mrs. Sunita, principal of Government Primary School, challenged her students to read 5,000 books between September 1st and December 1st. She promised them a special surprise if they met their goal. When December 1st arrived, the students had read 5,100 books and it was time for a surprise! The students were treated to a pizza party lunch. Afterwards, each student received a new book with a bookmark. The principal presented a certificate to the students from each class who had read the most books.

Now you will hear seven questions. Listen carefully and tick the correct box.

- Question 1) Was this story about a reading contest?
- Question 2) Were the students challenged to read 1,000 books?
- Question 3) Did the students receive a surprise?
- Question 4) Did the students receive a cake at the party?
- Question 5) Was the party at lunch time?
- Question 6) Did the students receive a book Rakesh after the party?
- Question 7) Did all the students receive a certificate, too?

Now listen to the next story.

Story 3: The Principal's House

Each day as Deepu rode the school bus, he saw a large empty block on State Street. One day, large machines levelled and graded the land, and a large hole was dug. Several days later, Deepu saw a cement truck and workers pouring the foundation of a building. Another day, workers nailed a wooden frame together and stacked bricks with mortar to build the outside walls. When Deepu returned to school after his two-week school holiday, he was surprised to see that the building turned out to be a house and that a family had moved in. He got an even bigger surprise when he saw his principal walked out the front door.

Now you will hear six questions. Listen carefully and tick the correct box.

Question 1) Was Deepu a principal?

Question 2) Did Deepu ride a bike to school?

Question 3) Did Deepu go on holiday for two weeks?

Question 4) Did the workers use cement for the foundation of the building?

Question 5) Did the workers build the walls after they finished the foundation?

Question 6) Was the building finished in two months?

Now listen to the next story.

Story 4: Swimming Pool Hero

Fourteen-year-old Ram is a hero. The Government High School student was enjoying as swim on Wednesday when he saw classmate Harinder drowning. Ram quickly performed CPR and Harinder resumed breathing. John had just learned first aid in his health class.

now you will hear seven questions. Listen carefully and tick the correct box.

Question 1) Is Ram a swimming champion?

Question 2) Does Ram go to Carver High School?

Question 3) Did Ram learn CPR at the Red Cross Centre?

Question 4) Was Ram drowning?

Question 5) Was Harinder Singh swimming?

Question 6) Did Ram bring the First Aid Kit to help Harinder?

Question 7) Was Harinder finally revived?

Now listen to the next story.

Story 5: A Bush with Fire

Mona Rani and Rakesh Kumar, two year-six students, were in the right place at the right time last week. On June 7th, while on a school excursion to the Twin Rivers National Park, they discovered a small, smouldering grass fire. Mona and Rakesh, remembering Fire Safety Week at school, quickly began scooping dirt and gravel from the trail and throwing it on the fire. Fortunately, they were able to extinguish the fire. According to officials, the fire was caused by someone who had thrown a burning cigarette out of a car window. Mona and Rakesh were honoured by the Fire Department for their fast action and bravery.

Now you will hear six questions. Listen carefully and tick the correct box.

- Question 1) Were Mona and Rakesh on holiday?
- Question 2) Did Mona and Rakesh discover the biggest bush fire ever?
- Question 3) Did Mona and Rakesh attend Fire Safety Week at school?
- Question 4) Did Mona and Rakesh put out the fire by throwing gravel on it?
- Question 5) Did Mona and Rakesh in the right place at the right time because they could extinguish the grass fire before it turned into a bush fire?
- Question 6) Did Mona and Rakesh become a fire fighter?

Now listen to the next story.

Story 6: The Talent Show Audition

Mina's throat was dry and her heart was pounding. It would be her turn on stage to audition for the school talent show. A boy who juggled had gone first. Now, two older girls were singing, and then it would be her turn. Would she remember the poem she had memorized, or would those two older girls have another reason to laugh at her like they did when she fell over in the playground? "Not this time!" Mina said to herself. After the audition, Mina ran home to tell her family the good news.

Now you will hear six questions. Listen carefully and tick the correct box.

- Question 1) Did the two girls juggle at the audition?
- Question 2) was Mina nervous because once she fell over in the playground?
- Question 3) Did the juggler perform first?
- Question 4) Was Mina going to recite a poem?
- Question 5) Did the two older girls laugh at Mina whilst she was performing on stage?
- Question 6) Do you think Mina was finally selected to perform at the talent show?

I hope you enjoyed the stories!

Thank you!

Listening Comprehension Answer Sheet

Code.....

Grade.....

Practice Story



Yes

No

5)

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☐

6)

☐
☐


Story 1

Yes

No

15)

☐
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16)

☐
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17)

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18)

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19)

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20)

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21)

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Story 2

Yes

No

13)

☐
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14)

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15)

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16)

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17)

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18)

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19)

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Story 3

Yes

No

13)

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14)

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15)

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16)

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17)

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18)

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Story 4

Yes

No

15)

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16)

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17)

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18)

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19)

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20)

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21)

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Story 5

Yes

No

1)

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2)

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3)

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4)

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5)

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6)

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☐


Story 6

Yes

No

1)

☐
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2)

☐
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3)

☐
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4)

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5)

☐
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6)

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Student code_____

Grade_____

Total number of scores	
------------------------	--

Pseudo word Reading (Decoding)

REPITITIONS: Instructions may be repeated once.

ADDITIONAL MATERIALS: Non-word Reading stimulus Sheet.

Circle 1 for each plausible response, 0 for an implausible response and NR for no response. A plausible response is any that can be logically derived from the spelling. There is space for you to transcribe responses if you want to. All responses should be tape recorded to check the accuracy of the transcription.

Here are some words. I want you to read as many of them as you can. You won't have seen these words before they are made up but I want you to try to read as many as possible.

Stimuli	Transcription	Score		
1. ib		1	0	NR
2. nat		1	0	NR
3. ven		1	0	NR
4. hap		1	0	NR
5. mell		1	0	NR
6. leck		1	0	NR
7. floxy		1	0	NR
8. wather		1	0	NR
9. improof		1	0	NR
10. gradly		1	0	NR
11. blighten		1	0	NR
12. baunted		1	0	NR
13. hudned		1	0	NR
14. unyen		1	0	NR
15. stinter		1	0	NR
16. centizen		1	0	NR
17. acksident		1	0	NR
18. deptonlel		1	0	NR
19. wissful		1	0	NR
20. hecemver		1	0	NR
21. licorish		1	0	NR
22. hadwarking		1	0	NR
23. phintober		1	0	NR
24. dompliment		1	0	NR
25. anymate		1	0	NR
26. tradamus		1	0	NR
27. accompany		1	0	NR
28. diskcheneri		1	0	NR
29. didderently		1	0	NR
30. unpostonious		1	0	NR

Phonological processing

Deletion task

MATERIALS: None

FEEDBACK: Give feedback on all practice items and test items 1 and 2 only

SCORING: Record correct answers as 1 and incorrect answers as 0. The total raw score for this subtest is the total number of correct test items up to the ceiling.

Direction: say "Let's play a word game"

Practice Items

Correct Response

- a) Say cup. Now say cup without saying /k/. up

If correct say, "That's right. Let's try the next one."

If incorrect say, "That's not quite right. Cat without saying /k/ is at."

- b) . Say meet. Now say meet without the saying /t/ me

- c) Say farm. Now say farm without saying /f/ arm

Score (1/0)

Test Items: Continue to give correct/incorrect feedback as before

1. Say bold. Now say bold without saying /b/. old

2. Say mat. Now say mat without saying /m/. at

Remaining test items: Provide no feedback on the remaining items

3. Say tan. Now say tan without saying /t/. an

4. Say mike. Now say mike without saying /k/. my

5. Say time. Now say time without saying /m/. tie

6. Say flame. Now say flame without /f/. lame

7. Say tiger. Now say tiger without saying /r/. tige

8. Say powder. Now say powder without saying /d/. power

9. Say winter. Now say winter without saying /t/. winner

10. Say rode. Now say rode without saying /d/. row

11. Say faster. Now say faster without saying /s/. fatter

12. Say place. Now say place without saying /c/. play

13. Say driver. Now say driver without saying /r/. drive

14. Say silk. Now say silk without saying /l/. sick

15. Say strain. Now say strain without saying /s/. train

16. Say split. Now say split without saying /p /. slit

17. Say fixed. Now say fixed without saying /k/. fist

Substitution Task

MATERIALS: None

FEEDBACK: Give feedback on all practice items.

SCORING: Record correct answers as 1 and incorrect answers as 0. The total raw score for this subtest is the total number of correct test items up to the ceiling.

Direction: say "Let's play a word game"

Practice Items	Correct Response
----------------	------------------

a) Say man. Now replace the sound of /m/ in man with /k/	can/kan
--	---------

If examinee responds correctly proceed to the next item.

If the examinee responds incorrectly say, "The word man becomes kan/can after replacing the sound of /m/ with /k/."

b) Say kite. Now replace the sound of /i/ in kite with /o/.	kot/cot
---	---------

c) Say dim. Now replace the sound of /m/ in dot with /p/	dip
--	-----

Score (1/0)

Test Items: Provide no feedback on the test items

18. Say tap. Now replace the sound of /t/ in tab with /n/.	nap	_____
19. Say hope. Now replace the sound of /h/ in hope with /r/	rope	_____
20. Say well. Now replace the sound of /w/ in well with /f/.	fell	_____
21. Say dog. Now replace the sound of /o/ in dog with /i/.	dig	_____
22. Say bill. Now replace the sound of /i/ in bill with /e/	bell	_____
23. Say make. Now replace the sound of /k/ in make with /l/.	male	_____
24. Say log. Now replace the sound of /g/ in log with /t/	lot	_____
25. Say wig. Now replace the sound of /g/ in wig with /n/.	win	_____
26. Say shop. Now replace the sound of /sh/ in shop with /ch/	chop	_____
27. Say bike. Now replace the sound of /b/ in bike with /h/.	hike	_____
28. Say hut. Now replace the sound of /u/ in hut with /o/	hot	_____
29. Say bell. Now replace the sound of /e/ in bell with /u/.	bull	_____
30. Say phone. Now replace the sound of /o/ in phone with /u/	fun	_____
31. Say slice. Now replace the sound of /c/ in slice with /d/.	slit	_____
32. Say cane. Now replace the sound of /n/ in cane with /p/.	cape	_____

Orthographic knowledge

Word Matching Task

Time: 1 min.

Student's Name/Code:

Grade:

Number of Correct Responses	
-----------------------------	--

Read the words given below carefully and underline those which are same.

Example: a. pig, pig

b. pat, cat

- | | |
|-------------------------|---------------------------------|
| 1. fat : fat | 27. together : together |
| 2. bad : bed | 28. example : example |
| 3. head : head | 29. durable : curable |
| 4. pull : full | 30. family : homily |
| 5. hard : hard | 31. vacation : vocation |
| 6. grow : grow | 32. cheerfully : fearfully |
| 7. ring : wing | 33. definite : definite |
| 8. slip : sleep | 34. however : however |
| 9. right : light | 35. several : several |
| 10. house : house | 36. solution : dilution |
| 11. open : open | 37. remember : december |
| 12. dozy : cosy | 38. resident : president |
| 13. belly : berry | 39. powerful : powerful |
| 14. river : river | 40. completely : completely |
| 15. country : country | 41. repealing : revealing |
| 16. copy : coffee | 42. movable : movable |
| 17. allied : alike | 43. actually : factually |
| 18. began : began | 44. typically : typically |
| 19. always : always | 45. experience : experience |
| 20. divorce : divorcee | 46. usually : visually |
| 21. doping : coping | 47. security : security |
| 22. foresee : foresee | 48. distribution : contribution |
| 23. mountain : mountain | 49. competition : competition |
| 24. feeling : filling | 50. unbreakable : nonbreakable |
| 25. weeding : weeping | |
| 26. during : during | |

Non-word Matching Task

Time: 1 min.

Student's Name/Code_____

Grade_____

Number of Correct Responses	
-----------------------------	--

Read the non-words given below carefully and underline those which are same.

Example: a. hig : hig

b. nat : dat

- | | |
|------------------------|-------------------------------|
| 1. han : han | |
| 2. ped : ved | 27. reveryday : reveriday |
| 3. floob : floob | 28. kutual : kootual |
| 4. vox : dox | 29. aurganic : urganic |
| 5. bealed : tealed | 30. enimal : enimal |
| 6. tride : tride | 31. hesident : lesident |
| 7. borse : borse | 32. mational : mational |
| 8. fean : feab | 33. barious : sarious |
| 9. skhool : skhool | 34. chogolate : chogolate |
| 10. ptar : jtar | 35. deautiful : peautiful |
| 11. pelly : pelly | 36. printiple : printiple |
| 12. cozi : tozi | 37. honderful : zonderful |
| 13. boter : poter | 38. insbection : insdection |
| 14. ifem : ifem | 39. adkustment : adkustment |
| 15. engry : engry | 40. bewspaper : mewspaper |
| 16. pamily : pamilee | 41. entroduced : untroduced |
| 17. nistake, : nistake | 42. imdustry : imdustry |
| 18. bublic : bubleec | 43. barticular : harticular |
| 19. poresi : noresi | 44. unjoyable : anjoyable |
| 20. tommon : tommon | 45. begetable : begitable |
| 21. cight : hight | 46. gleasurable : gleasurable |
| 22. jeeling : zeeling | 47. benerally : beneralli |
| 23. hower : hower | 48. intelliment : intelliment |
| 24. prodlem : prodlum | 49. helebration : helibration |
| 25. tpecial : tpecial | 50. tupervision : tupervision |
| 26. wountain : wounten | |

Word Chain Task

Time: 1 Min.

Student's Name/Code.....

Grade.....

Total Number of Correct Responses	
-----------------------------------	--

Try to find the words in each line. Be careful the spaces between the words are reduced but you should find the words and separate them by drawing a vertical line between them. You do not need to write them again.

Example: a. cataftermousethe

b. cat/after/mouse/the

1. hadmybrotherballyesterday
2. whitehappypenduckpaper
3. workminegapdriver
4. doorflowerflightandhim
5. houseredmapstreet
6. sugarfoodtastypeachitshell
7. shopmoptallcrylaughhair
8. robotcarechairtableten
9. singkilogofallguitar
10. mothertablewatchcargame

Sentences Chain Task

Time: 1 min.

Student's Name/Code_____

Grade_____

Total Number of correct Responses	
-----------------------------------	--

Try to find out the words in each line to make the correct sentence. Be careful, the space between the words is reduced but you should find the words and separate them by drawing a vertical line between them. You do not need to write them again.

Example: Iamwaitingforyou.

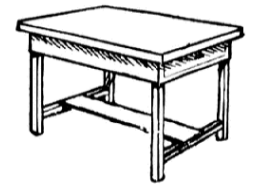
I/am/waiting/for/you.

1. I donotliketea
2. hiseyesarebrown.
3. hehasagoldring
4. cloudsbringrainforus.
5. weliketoplayinthepark
6. these mangoes are not fresh.
7. the sun is shining in the sky.
8. he wantsto become a teacher.
9. the gardener will water the plants
10. my aunt visits me every Sunday.

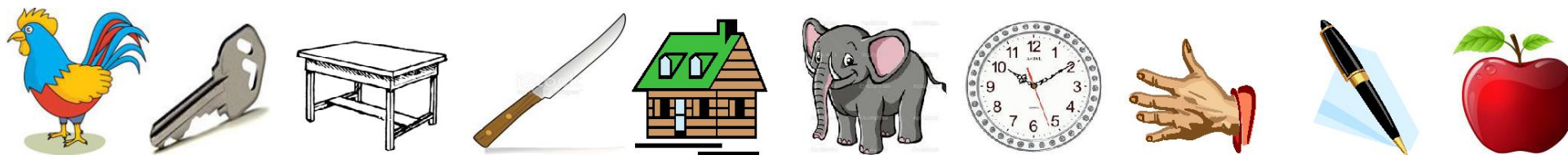
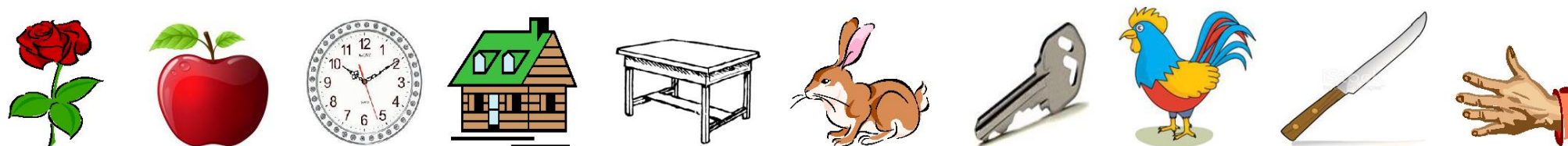
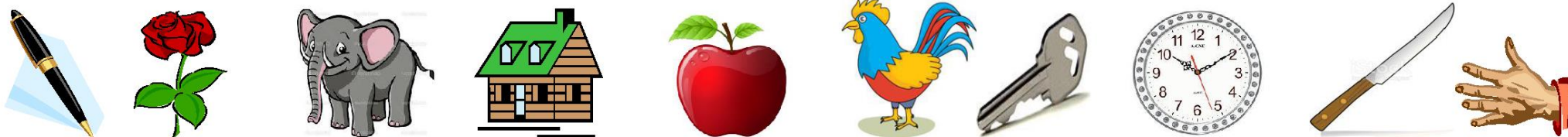
RAN Objects

Exercise

See the pictures of different objects given below and name these objects.



Now read all these objects from left to right in the rows given on the next page. Read them as fast as you can, do not stop until you reach at the end of the page.



Appendix C Punjabi Measures

ਪਠਨਬੋਧ ਪ੍ਰੀਖਿਆ (Reading Comprehension)

ਨਾਮ /ਕੋਡ.....

ਕਲਾਸ.....

ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਹਰ ਇੱਕ ਕਹਾਣੀ ਨੂੰ ਧਿਆਨ ਨਾਲ ਪੜ੍ਹੋ। ਹਰ ਕਹਾਣੀ ਤੋਂ ਬਾਦ ਦਿੱਤੇ ਗਏ ਹਰ ਇੱਕ ਪ੍ਰਸ਼ਨ ਨੂੰ ਧਿਆਨ ਨਾਲ ਪੜ੍ਹੋ ਅਤੇ ਦਿੱਤੇ ਗਏ ਵਿਕਲਪਾਂ ਵਿੱਚੋਂ ਠੀਕ ਵਿਕਲਪ ਚੁਣ ਕੇ ਉੱਤਰ ਦਿਓ।

ਅਭਿਆਸ ਕਹਾਣੀ

ਮੇਰੇ ਅਤੇ ਮੇਰੀ ਭੈਣ ਕੋਲ ਇੱਕ ਜਲ ਜੀਵਸ਼ਾਲਾ ਹੈ। ਇਸ ਵਿਚ ਤਿੰਨ ਬਹੁਤ ਹੀ ਸੁੰਦਰ ਸੁਨਿਹਰੀ ਰੰਗ ਦੀਆਂ ਮੱਛੀਆਂ ਹਨ। ਅਸੀਂ ਮੰਮੀ ਜੀ ਨੂੰ ਬੇਨਤੀ ਕੀਤੀ ਕਿ ਸਾਨੂੰ ਦੇ ਹੋਰ ਕਾਲੇ ਰੰਗ ਦੀਆਂ ਮੱਛੀਆਂ ਖਰੀਦ ਦੇਵੇ। ਮੰਮੀ ਜੀ ਨੇ ਸਾਨੂੰ ਦੇ ਹੋਰ ਲੈ ਦਿਤੀਆਂ। ਮੱਛੀਆਂ ਆਪਣੇ ਨਵੇਂ ਘਰ ਵਿਚ ਖੁਸ਼ ਲੱਗ ਰਹੀਆਂ ਸੀ। ਅਸੀਂ ਟੈਂਕ ਦਾ ਪਾਣੀ ਬਦਲੀ ਕਰ ਕੇ ਮੱਛੀਆਂ ਨੂੰ ਬਾਰੀ ਸਿਰ ਦਾਣਾ ਪਾਈਆ।

1) ਜਲ ਜੀਵਸ਼ਾਲਾ ਕਿਸ ਕੋਲ ਹੈ?

1. ਮੇਰੇ ਤੇ ਮੇਰੇ ਮਾਤਾ ਜੀ ਕੋਲ

3. ਮੇਰੇ ਮਾਪਿਆਂ ਕੋਲ

2. ਮੇਰੇ ਤੇ ਮੇਰੇ ਪਿਤਾ ਜੀ ਕੋਲ

4. ਮੇਰੇ ਤੇ ਮੇਰੀ ਭੈਣ ਕੋਲ

2) ਬਚਿੱਆ ਨੇ ਕਿਸ ਚੀਜ਼ ਦੀ ਮੰਗ ਕੀਤੀ?

1. ਦੇ ਖਿਡੌਣੇ ਲੈਣ ਦੀ

3. ਦੇ ਚਿੜੀਆਂ ਲੈਣ ਦੀ

2. ਦੇ ਮੱਛੀਆਂ ਲੈਣ ਦੀ

4. ਦੇ ਚਾਕਲੇਟ ਲੈਣ ਦੀ

3) ਨਵੀਆਂ ਮੱਛੀਆਂ ਦਾ ਕਿਹੜੇ ਰੰਗ ਦੀਆਂ ਸੀ?

1. ਸਤੰਦੀ

3. ਸੁਨਹਿਰੀ

2. ਕਾਲੇ

4. ਨੀਲੇ

4) ਟੈਂਕ ਵਿਚ ਕੁੱਲ ਕਿਨੀਆਂ ਮੱਛੀਆਂ ਸਨ?

1. ਪੰਜ

3. ਦੋ

2. ਤਿੰਨ

4. ਚਾਰ

5) ਮੱਛੀਆਂ ਆਪਣੇ ਨਵੇਂ ਘਰ ਵਿਚ.....?

1. ਖੁਸ਼ ਸਨ

3. ਲੜ ਰਹੀਆਂ ਸਨ

2. ਖੁਸ਼ ਨਹੀਂ ਸਨ

4. ਡਰ ਰਹੀਆਂ ਸਨ

6) ਇਸ ਕਹਾਣੀ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਚੁਣੋ?

1. ਮੇਰੇ ਅਤੇ ਮੇਰੀ ਭੈਣ

3. ਸਾਡੀ ਜਲ ਜੀਵਸ਼ਾਲਾ

2. ਸੁਨਿਹਰੀ ਮੱਛੀਆਂ

4. ਮੱਛੀਆਂ ਖਰੀਦਣਾ

ਇੱਕ ਡੱਬਾ (ਪੱਧਰ 1)

ਮੇਰੇ ਮਾਤਾ ਜੀ ਨੇ ਮੈਨੂੰ ਇੱਕ ਡੱਬਾ ਦਿੱਤਾ । ਮੈਂ ਇਸਨੂੰ ਮੇਜ ਤੇ ਰੱਖ ਲਿਆ । ਮੈਂ ਇਸ ਵਿੱਚ ਖਿਡੌਣਾ ਲੱਭ ਰਿਹਾ/ ਰਹੀ ਸੀ। ਅਚਾਨਕ ਇਸ ਵਿੱਚੋਂ ਇੱਕ ਚਿੱਟੇ ਖਰਗੋਸ਼ ਨੇ ਛਲਾਂਗ ਮਾਰੀ।

1) ਬੱਚੇ ਨੂੰ ਡੱਬਾ ਕਿਸਨੇ ਦਿੱਤਾ?

1. ਦਾਦਾ ਜੀ ਨੇ

3. ਮਾਤਾ ਜੀ ਨੇ

2. ਦਾਦੀ ਜੀ ਨੇ

4. ਪਿਤਾ ਜੀ ਨੇ

2) ਬੱਚੇ ਨੇ ਉਹ ਡੱਬਾ ਕਿੱਥੇ ਰਖਿਆ?

1. ਸੋਫੇ ਤੇ

3. ਫਰਸ਼ ਤੇ

2. ਮੇਜ ਤੇ

4. ਮੰਜੇ ਤੇ

3) ਬੱਚੇ ਨੇ ਡੱਬੇ ਵਿੱਚ ਕੀ ਸੋਚਿਆ ਸੀ?

1. ਖਿਡੌਣਾ

3. ਘੜੀ

2. ਮਠਿਆਈ

4. ਚਾਕਲੇਟ

4) ਤੋਹਫਾ ਕੀ ਸੀ?

1. ਚਿੱਟਾ ਕੁੱਤਾ

2. ਚਿੱਟਾ ਕਬੂਤਰ

3. ਚਿੱਟਾ ਬਲੂੰਗੜਾ

4. ਚਿੱਟਾ ਖਰਗੋਸ਼

ਮਛੇਰਾ (ਪੱਧਰ 2)

ਬਿੱਲੂ ਅਤੇ ਚੀਨੂ ਡੱਡੂ ਦੇ ਬੱਚੇ ਲੱਭ ਰਹੇ ਸੀ। ਅਚਾਨਕ, ਉਹਨਾਂ ਨੂੰ ਛਪਾਕ ਦੀ ਅਵਾਜ਼ ਸੁਣੀ। ਇੱਕ ਮਛੇਰਾ ਨਹਿਰ ਵਿੱਚ ਡਿੱਗ ਗਿਆ ਸੀ। ਉਹ ਤੈਰ ਨਹੀਂ ਸੀ ਸਕਦਾ, ਕਿਉਂਕਿ ਉਹਨੂੰ ਸੱਟ ਲਗ ਗਈ ਸੀ। ਬੱਚਿਆਂ ਨੇ ਉਹਨੂੰ ਬਾਹਰ ਖਿੱਚਣ ਦੀ ਕੋਸ਼ਿਸ਼ ਕੀਤੀ। ਉਹ ਬਹੁਤ ਭਾਰਾ ਸੀ। ਫਿਰ ਬਿੱਲੂ ਨੇ ਉਸਦਾ ਸਿਰ ਪਾਣੀ ਤੋਂ ਉਪਰ ਚੁੱਕ ਕੇ ਰੱਖਿਆ, ਉਦੋਂ ਤਕ ਚੀਨੂ ਸਹਾਇਤਾ ਲੈਣ ਲਈ ਭੱਜੀ।

1) ਬਿੱਲੂ ਅਤੇ ਚੀਨੂ ਝੀਲ ਦੇ ਕਿਨਾਰੇ ਕੀ ਕਰ ਰਹੇ ਸਨ?

1. ਡੱਡੂ ਦੇ ਬੱਚੇ ਲੱਭ ਰਹੇ ਸੀ

3. ਮੱਛਿਆਂ ਫੜ ਰਹੇ ਸੀ

2. ਖੇਡ ਰਹੇ ਸੀ

4. ਪਤੰਗ ਉਡਾ ਰਹੇ ਸੀ

2) ਬੱਚਿਆਂ ਨੇ ਕਾਹਦੀ ਆਵਾਜ਼ ਸੁਣੀ?

1. ਚੀਖ ਦੀ

3. ਰੋਣ ਦੀ

2. ਹੱਸਣ ਦੀ

4. ਛਪਾਕ ਦੀ

3) ਉੱਥੇ ਕੀ ਵਾਪਰਿਆ ਸੀ?

1. ਬਿੱਲੂ ਪਾਣੀ ਵਿੱਚ ਡਿੱਗ ਗਿਆ ਸੀ

3. ਮਛੇਰਾ ਪਾਣੀ ਵਿੱਚ ਡਿੱਗ ਗਿਆ ਸੀ

2. ਚੀਨੂ ਪਾਣੀ ਵਿੱਚ ਡਿੱਗ ਗਿਆ ਸੀ

4. ਬਿੱਲੂ ਅਤੇ ਚੀਨੂ ਪਾਣੀ ਵਿੱਚ ਡਿੱਗ ਗਏ ਸੀ

4) ਮਛੇਰਾ ਕਿਨਾਰੇ ਤੱਕ ਕਿਉਂ ਨਹੀਂ ਤੈਰ ਸਕਦਾ ਸੀ?

1. ਕਿਉਂਕਿ ਉਸਨੂੰ ਤੈਰਨਾ ਨਹੀਂ ਸੀ ਆਉਂਦਾ

3. ਕਿਉਂਕਿ ਬੱਚੇ ਉਸਨੂੰ ਕੱਢਣਾ ਨਹੀਂ ਸੀ
ਚਾਹੁੰਦੇ

2. ਕਿਉਂਕਿ ਉਹ ਮਰਨਾ ਚਾਹੁੰਦਾ ਸੀ

4. ਕਿਉਂਕਿ ਉਸਨੂੰ ਸੱਟ ਲਗ ਗਈ ਸੀ

5) ਬੱਚਿਆਂ ਨੇ ਕੀ ਕਰਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕੀਤੀ?

1. ਮਛੇਰੇ ਨੂੰ ਕਿਨਾਰੇ ਤੱਕ ਖਿੱਚਣ ਦੀ

3. ਡੱਡੂ ਫੜਣ ਦੀ

2. ਮੱਛਿਆਂ ਫੜਣ ਦੀ

4. ਸੱਪ ਫੜਣ ਦੀ

6) ਬੱਚੇ ਮਛੇਰੇ ਨੂੰ ਕਿਨਾਰੇ ਤੱਕ ਕਿਉਂ ਨਹੀਂ ਖਿੱਚ ਸਕੇ?

1. ਕਿਉਂਕਿ ਉਹ ਖਿੱਚਣਾ ਨਹੀਂ ਸੀ ਚਾਹੁੰਦੇ

3. ਕਿਉਂਕਿ ਉਹ ਬਹੁਤ ਭਾਰਾ ਸੀ

2. ਕਿਉਂਕਿ ਮਛੇਰਾ ਡਰ ਗਿਆ ਸੀ

4. ਕਿਉਂਕਿ ਉਹ ਬੇਹੋਸ਼ ਸੀ

7) ਬਿੱਲੂ ਨੇ ਮਛੇਰੇ ਦੀ ਮੱਦਦ ਕਿਵੇਂ ਕੀਤੀ?

1. ਉਸਦਾ ਹੱਥ ਪਾਣੀ ਤੋਂ ਉਪਰ ਚੁੱਕ ਕੇ

3. ਉਸਦੀ ਬਾਂਹ ਪਾਣੀ ਤੋਂ ਉਪਰ ਚੁੱਕ ਕੇ

2. ਉਸਦਿਆਂ ਲੱਤਾਂ ਪਾਣੀ ਤੋਂ ਉਪਰ ਚੁੱਕ ਕੇ

4. ਉਸਦਾ ਸਿਰ ਪਾਣੀ ਤੋਂ ਉਪਰ ਚੁੱਕ ਕੇ

8) ਚੀਨੂ ਨੇ ਮਛੇਰੇ ਦੀ ਮੱਦਦ ਕਿਵੇਂ ਕੀਤੀ?

1. ਉੱਥੇ ਖੜੀ ਰਹੀ

3. ਇੱਧਰ ਉੱਧਰ ਦੇੜ ਰਹੀ ਸੀ

2. ਉੱਥੇ ਬੈਠ ਗਈ

4. ਕਿਸੇ ਹੋਰ ਤੋਂ ਸਹਾਇਤਾ ਲੈਣ ਲਈ ਭੱਜੀ

ਸਮੁੰਦਰੀ ਚਿੜੀ(ਮੁਰਗਾਬੀ) (ਪੱਧਰ 3)

ਨਰਮ ਛਪਾਕ ਦੀ ਆਵਾਹ ਨਾਲ ਇੱਕ ਸਮੁੰਦਰੀ ਚਿੜੀ ਜਮੀਨ ਤੇ ਡਿੱਗ ਪਈ। ਕਾਲਾ ਅਤੇ ਭਾਰਾ ਤੇਲ ਉਹਦੇ ਖੰਭਾਂ ਨੂੰ ਗੁੰਦ ਦੇ ਵਾਂਗ ਚਿਪਕ ਗਿਆ ਸੀ। ਸਮੁੰਦਰ ਦੇ ਕਿਨਾਰੇ ਇੱਕ ਤੈਲਪੇਤ ਫੱਟਣ ਨਾਲ ਤੇਲ ਡੁੱਲ ਗਿਆ ਸੀ। ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੀ ਸਥਿਰਤਾ ਨੇ ਟਿੰਕੂ ਅਤੇ ਨਿਧੀ ਦਾ ਧਿਆਨ ਚੱਟਾਨੀ ਟੋਭੇ ਲੱਭਣ ਤੋਂ ਹਟਾ ਲਿਆ। ਜਦੋਂ ਨਿਧੀ ਨੇ ਉਸ ਨੂੰ ਟਿੰਕੂ ਦੀ ਕਮੀਜ ਵਿੱਚ ਲਪੇਟਿਆ, ਸੁਸਤ ਸਮੁੰਦਰੀ ਚਿੜੀ ਕਮਜ਼ੋਰ ਅਵਾਜ ਵਿੱਚ ਕਿਕਿਆਈ ਅਤੇ ਫਿਰ ਉਹ ਸਹਾਇਤਾ ਲੈਣ ਲਈ ਚੱਲੇ ਗਏ। ਬਾਅਦ ਵਿੱਚ ਬੱਚਿਆਂ ਦੇ ਸੁਨਣ ਵਿੱਚ ਆਇਆ ਸੀ ਕਿ ਪੰਛੀ ਨੂੰ ਚਿੜਿਆ-ਘਰ ਲੱਜਾ ਕੇ ਸਾਫ ਕੀਤਾ ਗਿਆ ਸੀ। ਤਾਂ ਜੋ ਉਹਨੂੰ ਸੁਰੱਖਿਅਤ ਸਮੁੰਦਰ ਵਿੱਚ ਭੇਜਿਆ ਜਾ ਸਕੇ।

- 1) ਉਹ ਕਿਹੜੀ ਪਹਿਲੀ ਚੀਜ਼ ਸੀ ਜਿਸ ਤੋਂ ਟਿੰਕੂ ਅਤੇ ਨਿਧੀ ਨੂੰ ਪਤਾ ਲੱਗਾ ਕੇ ਕੁੱਝ ਗਲਤ ਹੋ ਗਿਆ ਸੀ?
 1. ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਬੋਲਣ ਨਾਲ
 2. ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਉੱਡਣ ਨਾਲ
 3. ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਡਿੱਗਣ ਨਾਲ
 4. ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਚੱਲਣ ਨਾਲ
- 2) ਸਮੁੰਦਰੀ ਚਿੜੀ ਨੂੰ ਕੀ ਹੋਇਆ ਸੀ?
 1. ਸੱਟ ਲੱਗੀ ਸੀ
 2. ਭੁੱਖ ਲੱਗੀ ਸੀ
 3. ਖੰਭ ਤੇਲ ਨਾਲ ਲਿਬੜ ਗਏ ਸੀ
 4. ਠੰਡ ਲੱਗੀ ਸੀ
- 3) ਸਮੁੰਦਰ ਦੇ ਕਿਨਾਰੇ ਤੇਲ ਕਿਵੇਂ ਆਇਆ ਸੀ?
 1. ਤੇਲ ਦਾ ਟੈਂਕਰ ਫੱਟਣ ਨਾਲ
 2. ਦੁੱਧ ਦਾ ਟੈਂਕਰ ਫੱਟਣ ਨਾਲ
 3. ਪਾਣੀ ਦਾ ਟੈਂਕਰ ਫੱਟਣ ਨਾਲ
 4. ਪੈਟਰੋਲ ਦਾ ਟੈਂਕਰ ਫੱਟਣ ਨਾਲ
- 4) ਟਿੰਕੂ ਅਤੇ ਨਿਧੀ ਸਮੁੰਦਰ ਦੇ ਕਿਨਾਰੇ ਕਿਉਂ ਆਏ ਸੀ?
 1. ਮੱਛਿਆਂ ਫੜਣ
 2. ਖੇਡਣ
 3. ਡੱਡੂ ਫੜਣ
 4. ਚੱਟਾਨੀ ਟੋਭੇ ਲੱਭਣ
- 5) ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਕਿੱਸ ਵਿਵਹਾਰ ਨੇ ਟਿੰਕੂ ਅਤੇ ਨਿਧੀ ਦਾ ਧਿਆਨ ਖਿੱਚਿਆ?
 1. ਉਹਦੀ ਸਥਿਰਤਾ ਨੇ
 2. ਉਹਦੀ ਉਡਾਰੀ ਨੇ
 3. ਉਹਦੇ ਬੋਲਣ ਨੇ
 4. ਉਹਦੀ ਹਿੱਲਣ ਨੇ
- 6) ਬੱਚਿਆਂ ਨੂੰ ਸਮੁੰਦਰੀ ਚਿੜੀ ਦੇ ਜਿੰਦਾ ਹੋਣ ਦਾ ਕਿਵੇਂ ਪਤਾ ਲੱਗਾ?
 1. ਕਮਜ਼ੋਰ ਅਵਾਜ ਵਿੱਚ ਕਿਕਿਆਣ ਤੋਂ
 2. ਉਹਦੇ ਉੱਡਣ ਤੋਂ
 3. ਕਮਜ਼ੋਰ ਅਵਾਜ ਵਿੱਚ ਰੋਣ ਤੋਂ
 4. ਕਮਜ਼ੋਰ ਅਵਾਜ ਵਿੱਚ ਚਹਿਕਣ ਤੋਂ
- 7) ਬੱਚਿਆਂ ਨੇ ਉਸ ਸਮੁੰਦਰੀ ਚਿੜੀ ਦਾ ਕੀ ਕੀਤਾ?
 1. ਉਸ ਨੂੰ ਉੜਾ ਦਿੱਤਾ
 2. ਉਸ ਨੂੰ ਉੱਥੇ ਹੀ ਛੱਡ ਦਿੱਤਾ
 3. ਉਸ ਨੂੰ ਆਪਣੇ ਘਰ ਲੈ ਗਏ
 4. ਨਿਧੀ ਨੇ ਉਸ ਨੂੰ ਟਿੰਕੂ ਦੀ ਕਮੀਜ ਵਿੱਚ ਲਪੇਟਿਆ ਅਤੇ ਸਹਾਇਤਾ ਲਈ ਗਏ
- 8) ਬੱਚਿਆਂ ਦੀ ਹਿਮੰਤ ਦਾ ਕੀ ਨਤੀਜਾ ਨਿਕਲਿਆ ਸੀ?
 1. ਸਮੁੰਦਰੀ ਚਿੜੀ ਮਰ ਗਈ।
 2. ਸਮੁੰਦਰੀ ਚਿੜੀ ਨੂੰ ਸਾਫ਼ ਕਰ ਕੇ ਸਮੁੰਦਰ ਵਿੱਚ ਛੱਡ ਦਿੱਤਾ ਗਿਆ ਸੀ।
 3. ਸਮੁੰਦਰੀ ਚਿੜੀ ਨੂੰ ਚਿੜਿਆ-ਘਰ ਵਿੱਚ ਹੀ ਰੱਖ ਲਿਆ ਗਿਆ ਸੀ।
 4. ਸਮੁੰਦਰੀ ਚਿੜੀ ਨੂੰ ਸਾਫ਼ ਕਰ ਕੇ ਬੱਚਿਆਂ ਨੂੰ ਦੇ ਦਿੱਤਾ ਸੀ।

ਲੁੰਬੜੀ (ਪੱਧਰ 4)

ਸਾਰੇ ਜਾਨਵਰਾਂ ਵਿੱਚ ਸਿਆਸਤ ਲਈ ਲੁੰਬੜੀ ਦਾ ਕੋਈ ਵੀ ਸਾਨੀ ਨਹੀਂ ਹੈ। ਮਨੁੱਖ ਦਾ ਸ਼ੱਕ ਇਸ ਦਾ ਸਭ ਤੋਂ ਵੱਡਾ ਕੁਦਰਤੀ ਦੁਸ਼ਮਣ ਹੈ। ਜਦੋਂ ਇਸਦਾ ਪਿੱਛਾ ਕੀਤਾ ਜਾਂਦਾ ਹੈ, ਤਾਂ ਇਹ ਵਿਲੱਖਣ ਜੌਹਰ ਦਿਖਾਉਂਦਿਆਂ ਹਨ, ਇਥੋਂ ਤਕ ਕਿ ਆਪਣੀ ਸੁਗੰਧ ਨੂੰ ਫੇਰਨ ਲਈ ਇਹ ਭੱਡਾ ਦੀ ਪਿੱਠ ਤੇ ਸਵਾਰ ਹੋ ਜਾਂਦੀਆਂ ਹਨ। ਬਚਿੱਆਂ ਦੇ ਪਾਲਣ-ਪੋਸ਼ਣ ਦੀ ਜ਼ਿੰਮੇਵਾਰੀ ਦੇਵੇਂ ਮਾਤਾ ਅਤੇ ਪਿਤਾ ਲੁੰਬੜੀ ਸਾਂਝੇ ਤੌਰ ਤੇ ਨਿਭਾਉਂਦੇ ਹਨ। ਸ਼ਿਕਾਰ ਮੁਹਿੰਮ ਦੌਰਾਨ ਇਹ ਆਪਣੇ ਆਲੇ-ਦੁਆਲੇ ਦਾ ਇੱਕ ਅਦਭੁਤ ਗਿਆਨ ਪ੍ਰਾਪਤ ਕਰ ਲੈਣਦੀਆਂ ਹਨ, ਜਿਸ ਨੂੰ ਇਹ ਹੰਗਾਮੀ ਸਮੇਂ ਵਿਚ ਵਰਤਦੀਆਂ ਹਨ। ਇਸ ਦੀ ਇੱਕ ਬਹੁਤ ਵਧੀਆ ਉਦਾਹਰਨ ਹੈ ਇੱਕ ਸ਼ਿਕਾਰ ਲੁੰਬੜੀ ਦੀ ਕਹਾਣੀ। ਜਿਸ ਵਿਚ ਉਹ ਆਪਣਾ ਪਿੱਛਾ ਕਰਨ ਵਾਲਿਆਂ ਨੂੰ ਇੱਕ ਬੰਦ ਅਣਗੋਲੀ ਖਾਣ ਦੇ ਰੇਲਰ, ਜੋ ਕਿ ਇੱਕ ਗੋਲ ਵਾੜ ਨਾਲ ਘਿਰਿਆ ਹੋਇਆ ਸੀ ਦੇ ਉੱਤੇ ਚੜ੍ਹਾ ਦਿੰਦੀ ਹੈ। ਇਹ ਆਪ ਸਾਰੀਆਂ ਐਕੜਾਂ ਨੂੰ ਹਰਾ ਦਿੰਦੀ ਹੈ। ਸ਼ਿਕਾਰੀ ਕੁੱਤੇ ਬਿਨਾਂ ਸੋਚੇ ਸਮਝੇ ਥੱਲੇ ਇੱਕਠੇ ਕੀਤੇ ਪਾਣੀ ਵਿਚ ਡਿੱਗਣ ਲਈ ਇਸਦਾ ਪਿੱਛਾ ਕਰਦੇ ਹਨ। ਜਦਕਿ ਲੁੰਬੜੀ, ਜਾਹਰਾ ਤੌਰ ਤੇ ਉਸ ਇਲਾਕੇ ਤੇ ਜਾਣੂ ਹੋਣ ਕਰਕੇ ਵਾੜ ਦੇ ਕੰਢੇ-ਕੰਢੇ ਚੱਲੀ ਅਤੇ ਬੱਚ ਗਈ।

- 1) ਲੁੰਬੜੀ ਦੇ ਕਿਸ ਗੁਣ ਦਾ ਹੋਰ ਜਾਨਵਰ ਮੁਕਾਬਲਾ ਨਹੀਂ ਕਰ ਸਕਦੇ?
 1. ਸਿਆਸਤ
 2. ਸ਼ਿਕਾਰ
 3. ਤੇਜ ਭੱਜਣ
 4. ਲੜਾਈ ਕਰਨ
- 2) ਲੁੰਬੜੀ ਦਾ ਸਭ ਤੋਂ ਵੱਡਾ ਦੁਸ਼ਮਣ ਕੌਣ ਹੈ?
 1. ਕੁੱਤੇ
 2. ਮਨੁੱਖ
 3. ਕੁਦਰਤ
 4. ਇਸ ਦੀ ਚਲਾਕੀ
- 3) ਆਪਣੇ ਸ਼ਿਕਾਰ ਸਮੇਂ ਲੁੰਬੜੀਆਂ ਭੇਡਾਂ ਦੀ ਪਿੱਠ ਤੇ ਕਿਉਂ ਚੜ੍ਹ ਜਾਂਦੀਆਂ ਹਨ?
 1. ਲੁੱਕਣ ਲਈ
 2. ਹਮਲਾ ਕਰਨ ਲਈ
 3. ਆਪਣੀ ਸੁਗੰਧ ਫੇਰਨ ਲਈ
 4. ਭੱਜਣ ਲਈ
- 4) ਲੁੰਬੜੀ ਦੇ ਬੱਚਿਆਂ ਨੂੰ ਭੋਜਨ ਕੌਣ ਦਿੰਦਾ ਹੈ?
 1. ਮਨੁੱਖ
 2. ਮਾਤਾ ਲੁੰਬੜੀ
 3. ਪਿਤਾ ਲੁੰਬੜੀ
 4. ਦੇਵੇਂ ਮਾਤਾ ਅਤੇ ਪਿਤਾ ਲੁੰਬੜੀ
- 5) ਲੁੰਬੜੀ ਨੂੰ ਲੁੱਕਣ ਦੀਆਂ ਉੱਤਮ ਥਾਵਾਂ ਦਾ ਕਿਵੇਂ ਪਤਾ ਲਗਦਾ ਹੈ?
 1. ਆਪਣੇ ਸ਼ਿਕਾਰੀ ਅਭਿਆਣ ਤੋਂ
 2. ਲੱਭਣ ਕਰਕੇ
 3. ਮਨੁੱਖ ਤੋਂ
 4. ਸ਼ਿਕਾਰੀਆਂ ਤੋਂ
- 6) ਇਸ ਕਹਾਣੀ ਵਿਚ ਸ਼ਿਕਾਰੀਆਂ ਨੂੰ ਲੁੰਬੜੀ ਕਿੱਥੇ ਚੜ੍ਹਾ ਦਿੰਦੀ ਹੈ?
 1. ਵਾੜ ਤੇ
 2. ਖਾਣ ਤੇ
 3. ਖਾਣ ਦੇ ਰੇਲਰ ਤੇ
 4. ਕਿਨਾਰੇ ਤੇ
- 7) ਲੁੰਬੜੀ ਪਾਣੀ ਵਿਚ ਡਿੱਗਣ ਤੋਂ ਕਿਵੇਂ ਬਚੀ?
 1. ਭੱਜ ਕੇ
 2. ਵਾੜ ਦਾ ਸਹਾਰਾ ਲੈ ਕੇ
 3. ਸ਼ਿਕਾਰੀ ਕੁੱਤੇਆਂ ਦੀ ਸਹਾਇਤਾ ਲੈ ਕੇ
 4. ਕੰਢੇ-ਕੰਢੇ ਚੱਲ ਕੇ
- 8) ਸ਼ਿਕਾਰੀ ਕੁੱਤੇ ਖਤਰੇ ਨੂੰ ਕਿਉਂ ਨਹੀਂ ਦੇਖ ਸਕੇ?
 1. ਕਿਉਂ ਕਿ ਉਹਨਾਂ ਦਾ ਧਿਆਨ ਲੁੰਬੜੀ ਵਿਚ ਸੀ
 2. ਕਿਉਂ ਕਿ ਉਹ ਡਰੇ ਹੋਏ ਸੀ
 3. ਕਿਉਂ ਕਿ ਉਹ ਭੱਜ ਰਹੇ ਸੀ
 4. ਕਿਉਂ ਕਿ ਉਹ ਲੜ ਰਹੇ ਸੀ

ਸੁਨਣਬੋਧ ਪ੍ਰੀਖਿਆ (Listening Comprehension)

ਨਾਮ / ਕੋਡ.....

ਕਲਾਸ.....

ਨਮਸਕਾਰ ਬੱਚਿਉ, ਪ੍ਰੀਖਿਆ ਦੇ ਇਸ ਭਾਗ ਵਿਚ ਤੁਹਾਨੂੰ ਛੇ ਕਹਾਣੀਆਂ ਸੁਣਾਈਆਂ ਜਾਣਗੀਆਂ। ਹਰ ਇੱਕ ਕਹਾਣੀ ਦੇ ਬਾਅਦ ਕੁੱਝ ਪ੍ਰਸ਼ਨ ਪੜ੍ਹੇ ਜਾਣਗੇ। ਤੁਸੀਂ ਹਰ ਇੱਕ ਕਹਾਣੀ ਅਤੇ ਪ੍ਰਸ਼ਨ ਧਿਆਨ ਨਾਲ ਸੁਣੋ ਤੇ ਫਿਰ ਆਪਣੀ ਜਵਾਬ ਸ਼ੀਟ ਉੱਤੇ ਚਿੰਨ੍ਹ ਲਗਾਉ। ਅਤੇ ਯਾਦ ਰਹੇ ਕਿ “ਹਾਂ” ਜਵਾਬ ਲਈ ਗ੍ਰੇ ਡੱਬੇ ਉੱਤੇ ਅਤੇ “ਨਹੀਂ” ਜਵਾਬ ਲਈ ਸਫੇਦ ਡੱਬੇ ਉੱਤੇ ਨਿਸ਼ਾਨ ਲਗਾਉਣਾ ਹੈ।

ਅਭਿਆਸ ਕਹਾਣੀ

ਸਾਰੇ ਪੰਛੀਆਂ ਦੇ ਖੰਭ ਹੁੰਦੇ ਹਨ, ਪਰ ਸਾਰੇ ਉਡ ਨਹੀਂ ਸਕਦੇ। ਤਕਰੀਬਨ ਸਾਰੇ ਪੰਛੀ ਆਲ੍ਹਣਾ ਬਣਾਏ ਨੇ ਅਤੇ ਇਹਨਾਂ ਵਿਚ ਆਂਡੇ ਦਿੰਦੇ ਨੇ। ਕੁੱਝ ਪੰਛੀ ਆਪਣੇ ਆਲ੍ਹਣੇ ਰੁੱਖਾਂ ਤੇ ਬਣਾਉਂਦੇ ਨੇ। ਉਹ ਹਰ ਵੇਲੇ ਆਪਣੇ ਆਲ੍ਹਣੀਆਂ ਵਿਚ ਨਹੀਂ ਰਹਿੰਦੇ। ਮਾਦਾ ਪੰਛੀ ਬੱਚਿਆਂ ਨੂੰ ਉਡਣਾ ਸਿਖਾਉਂਦੀ ਹੈ। ਫਿਰ ਉਹ ਵੀ ਆਲ੍ਹਣਾ ਛੱਡ ਕੇ ਉਡ ਸਰਦੇ ਨੇ।

ਹੁਣ ਤੁਹਾਨੂੰ ਦੋ ਪ੍ਰਸ਼ਨ ਪੜ੍ਹ ਕਰ ਸੁਣਾਏ ਜਾਣਗੇ। ਤੁਸੀਂ ਆਪਣੀ ਜਵਾਬ ਪਤ੍ਰਿਕਾ ਉੱਤੇ ਚਿੰਨ੍ਹ ਲਗਾਏ। ਯਾਦ ਰਹੇ ਕਿ “ਹਾਂ” ਜਵਾਬ ਲਈ ਗਰੇ ਬਾਕਸ ਉੱਤੇ ਅਤੇ “ਨਹੀਂ” ਜਵਾਬ ਲਈ ਸਫੇਦ ਬਾਕਸ ਉੱਤੇ ਚਿੰਨ੍ਹ ਲਗਾਉਣਾ ਹੈ। ਇਹ ਜ਼ਰੂਰ ਨਿਸ਼ਚਿਤ ਕਰ ਲੈ ਕਿ ਠੀਕ ਬਾਕਸ ਉੱਤੇ ਹੀ ਚਿੰਨ੍ਹ ਲਗਾਉਣਾ ਹੈ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਕੀ ਸਾਰੇ ਪੰਛੀਆਂ ਦੇ ਖੰਭ ਹੁੰਦੇ ਹਨ ?

ਪ੍ਰਸ਼ਨ ਨੰ.2) ਕੀ ਨਰ ਪੰਛੀ ਬੱਚਿਆਂ ਨੂੰ ਉਡਣਾ ਸਿਖਾਉਂਦਾ ਹੈ ?

ਹੁਣ ਪਹਿਲੀ ਕਹਾਣੀ ਸੁਣਨ ਲਈ ਤਿਆਰ ਹੋ ਜਾਉ

ਕਹਾਣੀ 1- ਖੇਡਾਂ ਦਾ ਦਿਨ

ਇਸ ਸ਼ੁਕਰਵਾਰ ਨੂੰ ਸਰਕਾਰੀ ਪ੍ਰਾਇਮਰੀ ਸਕੂਲ ਵਿਚ ਖੇਡਾਂ ਦਾ ਦਿਨ ਮਨਾਇਆ ਜਾਵੇਗਾ। ਸੱਭ ਤੋਂ ਪਹਿਲਾਂ ਰੱਸਾ-ਕੱਸੀ ਦਾ ਖੇਡ ਖੇਡਿਆ ਜਾਵੇਗਾ, ਤੇ ਫਿਰ ਟੀਮਾਂ ਵਿਚਕਾਰ ਦੋੜਾਂ ਕਰਵਾਇਆਂ ਜਾਣਗੀਆਂ। ਦੇਪਹਿਰ ਦੀ ਰੋਟੀ ਤੋਂ ਬਾਅਦ ਵਿਦਿਆਰਥੀ ਗੋਲੇ ਵਾਲਿਆਂ ਖੇਡਾਂ ਖੇਡਣਗੇ। ਹਰ ਜਮਾਤ ਦੀਆਂ ਲਾਲ ਅਤੇ ਹਰੇ ਰੰਗ ਦੀਆਂ ਟੀਮਾਂ ਹੋਣਗੀਆਂ। ਵਿਦਿਆਰਥੀਆਂ ਨੇ ਯਾਦ ਨਾਲ ਉਸ ਦਿਨ ਆਪਣੀ ਟੀਮ ਦੇ ਰੰਗ ਦੀਆਂ ਕਮੀਜਾਂ ਪਾਕੇ ਆਈਆਂ ਹਨ।

ਖੇਡਾਂ ਖਤਮ ਹੋਣ ਤੋਂ ਬਾਅਦ ਸਾਰੀਆਂ ਟੀਮਾਂ ਨੂੰ ਇਨਾਮ ਅਤੇ ਫਲ ਵੰਡੇ ਜਾਣਗੇ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਕੀ ਇਸ ਸ਼ੁਕਰਵਾਰ ਨੂੰ ਸਰਕਾਰੀ ਪ੍ਰਾਇਮਰੀ ਸਕੂਲ ਵਿਚ ਖੇਡਾਂ ਦਾ ਦਿਨ ਮਨਾਇਆ ਜਾਵੇਗਾ?

ਪ੍ਰਸ਼ਨ ਨੰ. 2) ਕੀ ਸੱਭ ਤੋਂ ਪਹਿਲਾਂ ਰੱਸਾ-ਕੱਸੀ ਦਾ ਖੇਡ ਖੇਡਿਆ ਜਾਵੇਗਾ?

ਪ੍ਰਸ਼ਨ ਨੰ.3) ਕੀ ਗੋਲੇ ਵਾਲਿਆਂ ਖੇਡਾਂ ਦੇਪਹਿਰ ਦੀ ਰੋਟੀ ਤੋਂ ਪਹਿਲਾਂ ਕਰਵਾਇਆਂ ਜਾਣਗੀਆਂ ?

ਪ੍ਰਸ਼ਨ ਨੰ.4) ਕੀ ਸਾਰੇ ਵਿਦਿਆਰਥੀਆਂ ਨੇ ਲਾਲ ਤੇ ਪੀਲੇ ਰੰਗ ਦੀਆਂ ਕਮੀਜਾਂ ਪਾਈਆਂ ਹਨ ?

ਪ੍ਰਸ਼ਨ ਨੰ.5) ਕੀ ਲਾਲ ਅਤੇ ਹਰਾ ਰੰਗ ਉਹਨਾਂ ਦੀ ਟੀਮ ਦਾ ਚਿੰਨ੍ਹ ਹੈ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਖੇਡਾਂ ਦਾ ਦਿਨ ਇਸ ਸ਼ਨੀਵਾਰ ਨੂੰ ਹੋਵੇਗਾ ?

ਪ੍ਰਸ਼ਨ ਨੰ.7) ਕੀ ਖੇਡਾਂ ਤੋਂ ਬਾਅਦ ਸਾਰੀਆਂ ਟੀਮਾਂ ਨੂੰ ਫਲ ਮਿਲੇ?

ਚੁਣ ਅਗਲੀ ਕਹਾਣੀ ਸੁਣੋ ।

ਕਹਾਣੀ 2- ਤੈਰਾਕੀ

ਤੈਰਨਾ ਸਾਰੇ ਪਸੰਦ ਕਰਦੇ ਹਨ। ਕੁੱਝ ਲੋਕ ਤੈਰਾਕੀ ਦੌੜ ਵਿਚ ਤੈਰਨਾ ਪਸੰਦ ਕਰਦੇ ਹਨ। ਜਿਤੱਥੇ ਲਈ ਉਹ ਤੇਜ਼ ਤੈਰਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰਦੇ ਹਨ। ਪਰ ਜਿਆਦਾਤਰ ਲੋਕ ਸ਼ੌਂਕ ਲਈ ਤੈਰਦੇ ਹਨ। ਅਸੀਂ ਤਲਾਬਾਂ, ਨਦੀਆਂ ਅਤੇ ਸਮੁੰਦਰ ਵਿਚ ਤੈਰ ਸਕਦੇ ਹਾਂ। ਅਸੀਂ ਆਪਣੀਆਂ ਬਾਂਹਾਂ ਅਤੇ ਲੱਤਾਂ ਘੁਮਾ ਕੇ ਪਾਣੀ ਵਿਚ ਤੈਰਦੇ ਹਾਂ। ਅਸੀਂ ਪਾਣੀ ਦੇ ਹੇਠਾਂ ਤੈਰ ਸਕਦੇ ਹਾਂ, ਪਰ ਸਾਹ ਨਹੀਂ ਲੈ ਸਕਦੇ। ਜਦੋਂ ਅਸੀਂ ਸਮੁੰਦਰ ਦੇ ਪਾਣੀ ਦੇ ਹੇਠਾਂ ਤੈਰਦੇ ਹਾਂ ਤਾਂ ਸਾਰੇ ਤਰਾਂ ਦੀਆਂ ਮੱਛੀਆਂ ਵੇਖ ਸਕਦੇ ਹਾਂ। ਸਾਨੂੰ ਤੈਰਦੇ ਸਮੇਂ ਉਨੀ ਹੀ ਦੂਰ ਜਾਣਾ ਚਾਹੀਦਾ ਹੈ, ਜਿਥੋਂ ਤਕ ਸਾਨੂੰ ਦੂਜੇ ਲੋਕ ਵੇਖ ਸਕਣ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਕੀ ਸਾਰੇ ਲੋਕ ਤੈਰਨਾ ਪਸੰਦ ਕਰਦੇ ਹਨ?

ਪ੍ਰਸ਼ਨ ਨੰ. 2) ਕੀ ਲੋਕ ਜਿਤੱਥੇ ਅਤੇ ਸ਼ੌਂਕ ਲਈ ਤੈਰਾਕੀ ਕਰਦੇ ਹਨ?

ਪ੍ਰਸ਼ਨ ਨੰ.3) ਕੀ ਜਿਤੱਥੇ ਲਈ ਤੇਜ਼ ਤੈਰਨਾ ਪੈਂਦਾ ਹੈ?

ਪ੍ਰਸ਼ਨ ਨੰ.4) ਕੀ ਅਸੀਂ ਸਿਰਫ਼ ਤਲਾਬਾਂ ਅਤੇ ਨਦੀਆਂ ਵਿਚ ਹੀ ਤੈਰ ਸਕਦੇ ਹਾਂ ?

ਪ੍ਰਸ਼ਨ ਨੰ.5) ਕੀ ਅਸੀਂ ਸਮੁੰਦਰ ਵਿਚ ਤੈਰ ਸਕਦੇ ਹਾਂ ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਅਸੀਂ ਪਾਣੀ ਹੇਠਾਂ ਲੰਬੇ ਸਮੇਂ ਤੱਕ ਰਹਿ ਸਕਦੇ ਹਾਂ ?

ਪ੍ਰਸ਼ਨ ਨੰ.7) ਕੀ ਸਾਨੂੰ ਇੱਕਲੇ ਦੂਰ ਤਕ ਤੈਰਨਾ ਚਾਹੀਦਾ ਹੈ?

ਹੁਣ ਅਗਲੀ ਕਹਾਣੀ ਸੁਣੋ ।

ਕਹਾਣੀ 3- ਤੁਫਾਨੀ ਰਾਤ

ਇਹ ਇੱਕ ਘਣਘੋਰ, ਤੁਫਾਨੀ ਰਾਤ ਸੀ। ਚੰਦ ਬੱਦਲਾਂ ਦੇ ਪਿੱਛੇ ਸੀ। ਡਾਢਾ ਮੀਂਹ ਪੈ ਰਿਹਾ ਸੀ, ਅਤੇ ਹਵਾ ਵੀ ਜ਼ੋਰਦਾਰ ਚੱਲ ਰਹੀ ਸੀ। ਚੀਨੂੰ ਖੁਸ਼ ਸੀ ਕਿਉਂਕਿ ਉਹ ਰਜਾਈ ਵਿਚ ਸੀ। ਉਹ ਸੁੱਕਾ ਅਤੇ ਗਰਮ ਸੀ ਅਤੇ ਆਪਣੀ ਮੰਨ-ਪਸੰਦ ਕਿਤਾਬ ਪੜ੍ਹ ਰਿਹਾ ਸੀ। ਅਚਾਨਕ ਉਸਨੇ ਖਿੜਕੀ ਦੇ ਬਾਹਰ ਇੱਕ ਧੜਾਕੇ ਦੀ ਅਵਾਜ਼ ਸੁਣੀ। ਉਹ ਇੱਕਦਮ ਬੁੜ੍ਹਕ ਗਿਆ ਪਰ ਹਿੰਮਤ ਕਰ ਕੇ ਖਿੜਕੀ ਤੱਕ ਪੁੱਜ ਕੇ ਉਹਨੇ ਬਾਹਰ ਦੇਖਿਆ। ਮੀਂਹ ਵਿੱਚੋਂ ਉਹਨੇ ਵੇਖਿਆ ਕਿ ਇੱਕ ਬੁੱਢਾ ਰੁੱਖ ਜੜ੍ਹੋਂ ਉਖੜ ਗਿਆ ਸੀ। ਇਹ ਸੜਕ ਦੇ ਦੂਜੇ ਪਾਸੇ ਸੀ। ਚੀਨੂੰ ਨੂੰ ਉਮੀਦ ਸੀ ਕਿ ਕਲ ਨੂੰ ਤੁਫਾਨ ਚਲਾ ਜਾਵੇਗਾ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਚੀਨੂੰ ਖੁਸ਼ ਕਿਉਂ ਸੀ ਕਿਉਂਕਿ ਉਹ ਰਜਾਈ ਵਿਚ ਸੀ ?

ਪ੍ਰਸ਼ਨ ਨੰ. 2) ਕੀ ਚੀਨੂੰ ਤੁਫਾਨ ਤੋਂ ਡਰ ਗਿਆ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ.3) ਕੀ ਚੀਨੂੰ ਬਿਜਲੀ ਲਿਸ਼ਕਣ ਤੋਂ ਬੁੜ੍ਹਕਿਆ ?

ਪ੍ਰਸ਼ਨ ਨੰ.4) ਕੀ ਬੱਦਲਾਂ ਕੀ ਅਵਾਜ਼ ਨੇ ਚੀਨੂੰ ਨੂੰ ਉਠਾ ਦਿੱਤਾ ਸੀ ?

ਪ੍ਰਸ਼ਨ ਨੰ.5) ਕੀ ਰੁੱਖ ਰਾਤ ਵੇਲੇ ਡਿੱਗਿਆ ਸੀ ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਚੀਨੂੰ ਨੂੰ ਉਮੀਦ ਸੀ ਕਿ ਤੁਫਾਨ ਅਗਲੇ ਦਿਨ ਵੀ ਰਹੇਗਾ?

ਹੁਣ ਅਗਲੀ ਕਹਾਣੀ ਸੁਣੋ ।

ਕਹਾਣੀ 4 - ਮਗਰ-ਮੱਛ

ਮਗਰ-ਮੱਛ ਪਾਣੀ ਵਿਚ ਰਹਿੰਦੇ ਨੇ ਅਤੇ ਮਾਸ ਖਾਂਦੇ ਹਨ। ਕਦੇ-ਕਦੇ ਇਹ ਮੱਛੀਆਂ ਖਾਂਦੇ ਹਨ, ਪਰ ਇਹ ਹਮਲਾ ਕਰ ਦੇ ਨੇ ਅਤੇ ਹਰ ਤਰ੍ਹਾਂ ਦੇ ਜਾਨਵਰ ਨੂੰ ਮਾਰ ਦਿੰਦੇ ਹਨ। ਇਹ ਪਹਿਲਾਂ ਤੋਂ ਮਰੇ ਜਾਨਵਰਾਂ ਨੂੰ ਵੀ ਖਾਂਦੇ ਨੇ। ਇੱਕ ਮਾਤਾ ਮਗਰ-ਮੱਛ ਬਹੁਤ ਸਾਰੇ ਆਂਡੇ ਦਿੰਦੀ ਹੈ। ਉਹ ਨਦੀ ਦੇ ਕੰਢੇ ਮਿੱਟੀ ਵਿਚ ਡੁੰਗਾ ਖੱਡਾ ਪੁੱਟ ਕੇ ਇਸ ਵਿਚ ਆਂਡੇ ਦੇ ਕੇ ਇਹਨਾਂ ਨੂੰ ਮਿੱਟੀ ਨਾਲ ਢੱਕ ਦਿੰਦੀ ਹੈ। ਉਹ ਇਹਨਾਂ ਦੇ ਟੁਟਣ ਤਕ ਇਹਨਾਂ ਦੇ ਨੇੜੇ ਹੀ ਰਹਿੰਦੀ ਹੈ। ਜਦੋਂ ਬੱਚੇ ਮਗਰ-ਮੱਛ ਬਾਹਰ ਨਿਕਲਣ ਲਈ ਤਿਆਰ ਹੋ ਜਾਂਦੇ ਨੇ ਤਾਂ ਆਪਣੀ ਮਾਂ ਨੂੰ ਬੁਲਾਂਦੇ ਹਨ। ਉਹਨਾਂ ਦਾ ਰੋਲਾ ਸੁਣਦੀ ਹੈ ਅਤੇ ਉਹਨਾਂ ਦੀ ਆਲ੍ਹਣੇ ਵਿਚੋਂ ਨਿਕਲਣ ਲਈ ਸਹਾਇਤਾ ਕਰਦੀ ਹੈ। ਜਦੋਂ ਬੱਚੇ ਆਲ੍ਹਣੇ ਵਿਚੋਂ ਬਾਹਰ ਆ ਜਾਂਦੇ ਹਨ, ਤਾਂ ਉਹ ਉਹਨਾਂ ਨੂੰ ਤੈਰਨਾ ਸਿਖਾਉਂਦੀ ਹੈ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਕੀ ਮਗਰ-ਮੱਛ ਸਾਰੇ ਜਾਨਵਰਾਂ ਦਾ ਸ਼ਿਕਾਰ ਕਰਦੇ ਹਨ ?

ਪ੍ਰਸ਼ਨ ਨੰ. 2) ਕੀ ਮਾਤਾ ਮਗਰ-ਮੱਛ ਆਂਡੇ ਦਿੰਦੀ ਹੈ ?

ਪ੍ਰਸ਼ਨ ਨੰ. 3) ਕੀ ਮਾਤਾ ਮਗਰ-ਮੱਛ ਆਂਡਿਆਂ ਨੂੰ ਪਾਣੀ ਨਾਲ ਢੱਕਦੀ ਹੈ?

ਪ੍ਰਸ਼ਨ ਨੰ. 4) ਕੀ ਮਾਤਾ ਮਗਰ-ਮੱਛ ਆਂਡਿਆਂ ਦੇ ਟੁਟਣ ਤੱਕ ਇਹਨਾਂ ਦੀ ਰਾਖੀ ਕਰਦੀ ਹੈ?

ਪ੍ਰਸ਼ਨ ਨੰ. 5) ਕੀ ਬੱਚੇ ਆਲ੍ਹਣੇ ਵਿਚੋਂ ਆਪੇ ਨਿਕਲ ਆਏ ਸਨ ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਨਵੇਂ ਜੰਮੇ ਬੱਚੇ ਤੈਰਨਾ ਜਾਣਦੇ ਸਨ ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਤੁਸੀਂ ਸਮਝਦੇ ਹੋ ਕਿ ਮਾਤਾ ਮਗਰ-ਮੱਛ ਇੱਕ ਚੰਗੀ ਮਾਂ ਹੈ?

ਹੁਣ ਅਗਲੀ ਕਹਾਣੀ ਸੁਣੋ।

ਕਹਾਣੀ 5 - ਥਲ ਜੀਵਸ਼ਾਲਾ

ਰਾਣੀ ਬਸ ਦੀ ਉਡੀਕ ਕਰਦੀ ਹੋਈ ਆਪਣੇ ਵਿਗਿਆਨ ਦੇ ਪ੍ਰਾਜੈਕਟ ਥਲ ਜੀਵਸ਼ਾਲਾ ਬਾਰੇ ਸੋਚ ਰਹੀ ਸੀ। ਉਹਨੂੰ ਪਤਾ ਸੀ ਕਿ ਉਸ ਦੇ ਪਿਤਾ ਜੀ ਕੋਲ ਇੱਕ ਮੱਛੀਆਂ ਵਾਲਾ ਟੈਂਕ ਖਾਲੀ ਪਿਆ ਹੈ। ਸ਼ਾਇਦ ਉਹ ਇਹ ਟੈਂਕ ਉਸਨੂੰ ਉਹਨਾਂ ਦਾ ਕਾਰ-ਘਰ ਸਾਫ਼ ਕਰਨ ਤੇ ਦੇ ਦੇਣਗੇ। ਉਹ ਮਿੱਟੀ ਪਿਛਲੇ ਵਿਹੜੇ ਵਿੱਚੋਂ ਲੈ ਆਵੇਗੀ, ਪਰ ਉਹ ਇਸ ਵਿੱਚ ਰਹਿਣ ਵਾਲਾ ਜੀਵ ਕਿੱਥੋਂ ਲੈ ਕੇ ਆਵੇਗੀ? ਅਚਾਨਕ ਉਸ ਨੂੰ ਆਪਣੇ ਗੁਆਂਢੀਆਂ ਦੀ ਕੰਧ ਤੇ ਇੱਕ ਛੋਟੇ ਜਾਨਵਰ ਦੀ ਝਲਕ ਪਈ। ਇੱਕ ਛਿਪਕਲੀ ਆਪਣੀਆਂ ਚਮਕਦਾਰ ਕਾਲੀਆਂ ਅੱਖਾਂ ਨਾਲ ਉਸ ਵਲ ਦੇਖ ਰਹੀ ਸੀ। ਉਸਨੇ ਬਸਤੇ ਵਿੱਚੋਂ ਆਪਣਾ ਰੋਟੀ ਵਾਲਾ ਡੱਬਾ ਕੱਢ ਕੇ ਉਸਦੇ ਵਿਚਲੀ ਰੋਟੀ ਸੁੱਟ ਦਿੱਤੀ ਅਤੇ ਹੇਲੀ-ਹੇਲੀ ਅੱਗੇ ਵਧ ਗਈ।

ਪ੍ਰਸ਼ਨ ਨੰ. 1) ਕੀ ਰਾਣੀ ਰਾਣੀ ਬਸ ਦੀ ਉਡੀਕ ਕਰਦੀ ਹੋਈ ਆਪਣੇ ਪ੍ਰਾਜੈਕਟ ਸੋਚ ਰਹੀ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ. 2) ਕੀ ਰਾਣੀ ਨੂੰ ਮੱਛੀਆਂ ਵਾਲਾ ਟੈਂਕ ਉਸਨੂੰ ਕਾਰ-ਘਰ ਸਾਫ਼ ਕਰਨ ਤੇ ਮਿਲੇਗਾ?

ਪ੍ਰਸ਼ਨ ਨੰ. 3) ਕੀ ਰਾਣੀ ਮਿੱਟੀ ਬਾਗ ਵਿੱਚੋਂ ਲੈ ਆਵੇਗੀ?

ਪ੍ਰਸ਼ਨ ਨੰ. 4) ਕੀ ਥਲ ਜੀਵਸ਼ਾਲਾ ਵਿੱਚ ਛਿਪਕਲੀ ਰਹੇਗੀ?

ਪ੍ਰਸ਼ਨ ਨੰ.5) ਕੀ ਗੁਆਂਢੀਆਂ ਦੀ ਕੰਧ ਤੇ ਇੱਕ ਮਕੜੀ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਰਾਣੀ ਰੋਟੀ ਵਾਲੇ ਡੱਬੇ ਵਿੱਚ ਛਿਪਕਲੀ ਪਾਉਣ ਲਈ ਜਾ ਰਹੀ ਸੀ ?

ਹੁਣ ਅਗਲੀ ਕਹਾਣੀ ਸੁਣੋ ।

ਕਹਾਣੀ 6 - ਪਾਲਤੂ ਤੇਤਾ

ਇਹ ਗੱਲ ਜੰਗਲ ਦੀ ਅੱਗ ਵਾਂਗ ਫੈਲ ਗਈ ਕਿ ਰਾਜੂ ਇੱਕ ਤੇਤੇ ਦਾ ਮਾਲਕ ਬਣ ਗਿਆ। ਸਵੇਰੇ ਹੀ ਰਾਜੂ ਦੇ ਸਾਰੇ ਦੇਸਤ ਉਸਦੇ ਘਰ ਆਏ ਸ਼ੁਰੂ ਹੋ ਗਏ। ਲਾਲੀ ਦਿਖਣ ਵਾਲਿਆਂ ਵਿਚੋਂ ਸਭ ਤੋਂ ਪਹਿਲਾ ਸੀ। ਉਹ ਹਮੇਸ਼ਾ ਇੱਕ ਨਵੀਂ ਤਜਵੀਜ਼ ਦੇਣ ਲਈ ਤਿਆਰ ਹੁੰਦਾ ਹੈ। ਤੇਤੇ ਵਿਚ ਤੇਤੇਆਂ ਵਾਲੇ ਸਾਰੇ ਗੁਣ ਸਨ। ਇਹ ਤੇਤਾ ਕਿਤਾਬਾਂ ਅਤੇ ਫਿਲਮਾਂ ਵਿਚ ਵਿਖਣ ਵਾਲੇ ਤੇਤੇਆਂ ਵਰਗਾ ਹੀ ਸੀ। ਇਸ ਦੇ ਖੰਭ ਤਿਤਰੇ, ਚਮਕਦਾਰ ਲਾਲ ਛਾਤੀ ਅਤੇ ਗੂੜ੍ਹੇ ਰੰਗ ਦਾ ਮੱਥਾ ਸੀ। ਪਰ ਸਾਡੀ ਮਾਯੂਸੀ ਦਾ ਕਾਰਨ ਇਸ ਦਾ ਨਾ ਬੋਲ ਸਕਣਾ ਸੀ। ਇਸ ਨੇ ਬਹੁਤ ਚਾਂਗਾ ਮਾਰਿਆ, ਪਰ ਸ਼ਬਦ ਇੱਕ ਵੀ ਨਹੀਂ। ਪਹਿਲਾ ਸ਼ਬਦ ਮਿੱਠੂ ਬੋਲਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਵਿਚ ਉਸਨੇ ਹਵਾ ਮੂੰਹ ਵਿਚ ਭਰ ਕੇ ਬਹੁਤ ਉੱਚੀ ਚੀਕਾਂ ਮਾਰੀਆਂ। ਅਖੀਰ ਸਾਰੇ 'ਹੈਲੋ ਰਾਜੂ' ਤੇ ਮੰਨ ਗਏ।

ਪਰ, ਤੇਤੇ ਨੂੰ ਬੋਲਨਾ ਕਿਵੇਂ ਸਿਖਾਇਆ ਜਾਵੇ?

"ਇਸ ਨੂੰ ਸ਼ਬਦਾਂ ਦੇ ਅੱਖਰ ਸਿਖਾਉ"

"ਨਹੀਂ, ਲਾਲੀ, ਤੂੰ ਇਸ ਨੂੰ ਹਿੱਜੇ ਨਹੀਂ ਸਿਖਾ ਸਕਦਾ।"

"ਸ਼ਬਦਾਂ ਦੀ ਅਵਾਜ਼ ਤੇੜ ਕੇ ਸਿਖਾਉ, ਜਿਵੇਂ ਕਿ 'ਹੈ' 'ਲੇ'।"

"ਨਹੀਂ, ਲਾਲੀ, ਤੂੰ ਇਸ ਨੂੰ ਐਵੇਂ ਨਹੀਂ ਸਿਖਾ ਸਕਦਾ।"

"ਜਦੋਂ ਇਹ ਸਹੀ ਅਵਾਜ਼ ਕੱਢਦਾ ਹੈ ਤਾਂ ਇਸ ਨੂੰ ਚੋਗਾ ਜਾਂ ਰੋਟੀ ਦਾ ਟੁਕੜਾ ਦਿਉ।"

"ਨਹੀਂ, ਲਾਲੀ!"

ਦੇ ਘੰਟੇ ਬਾਅਦ ਮਿੱਠੂ ਅਜੇ ਵੀ ਚਾਂਗਾ ਮਾਰ ਰਿਹਾ ਸੀ, ਪਰ ਬੋਲਿਆ ਕੁੱਝ ਵੀ ਨਹੀਂ। ਅਸੀਂ ਕੋਸ਼ਿਸ਼ ਛੱਡ ਦਿੱਤੀ।

ਉਸ ਰਾਤ ਜਦੋਂ ਰਾਜੂ ਨੀਂਦ ਵਿਚ ਸੀ, ਉਸ ਨੇ ਆਪਣੇ ਤੇਤੇ ਦੇ ਪਹਿਲੇ ਸ਼ਬਦ ਸੁਣੇ: "ਨਹੀਂ, ਲਾਲੀ!"

ਪ੍ਰਸ਼ਨ ਨੰ.1) ਕੀ ਲਾਲੀ ਨੂੰ ਸਾਰੇ ਸਤਾਉਣ ਵਾਲਾ ਸਮਝਦੇ ਸਨ?

ਪ੍ਰਸ਼ਨ ਨੰ.2) ਕੀ ਤੇਤੇ ਦਾ ਮੱਥਾ ਚਿੱਟੇ ਰੰਗ ਦਾ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ.3) ਕੀ ਤੇਤੇ ਦਾ ਨਾਂ ਗੰਗਾਰਾਮ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ. 4) ਕੀ ਲਾਲੀ ਨੇ ਤੇਤੇ ਨੂੰ ਸਿਖਾਉਣ ਦੇ ਕੁੱਲ ਤਿੰਨ ਢੰਗ ਦੱਸੇ?

ਪ੍ਰਸ਼ਨ ਨੰ. 5) ਕੀ ਤੇਤੇ ਨੂੰ ਪਹਿਲੇ ਸ਼ਬਦ 'ਹੈਲੋ ਰਾਜੂ' ਸਿਖਾਉਣ ਦਾ ਕਾਰਨ ਰਾਜੂ ਦਾ ਉਲਟਾ ਮਾਲਕ ਹੋਣਾ ਸੀ?

ਪ੍ਰਸ਼ਨ ਨੰ.6) ਕੀ ਮਿੱਠੂ ਦੇ ਪਹਿਲੇ ਸ਼ਬਦ 'ਹੈਲੋ ਰਾਜੂ' ਸੀ?

ਸੁਨਣਬੋਧ ਪ੍ਰੀਖਿਆ

ਜਵਾਬ ਸ਼ੀਟ

ਨਾਮ / ਕੋਡ.....

ਕਲਾਸ.....

ਅਭਿਆਸ ਕਰਾਈ



ਹਾਂ ਨਹੀਂ

- | | | |
|----|--------------------------|--------------------------|
| 1) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | <input type="checkbox"/> | <input type="checkbox"/> |



ਕਰਾਈ 1

ਹਾਂ ਨਹੀਂ

- | | | |
|----|--------------------------|--------------------------|
| 1) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) | <input type="checkbox"/> | <input type="checkbox"/> |
| 6) | <input type="checkbox"/> | <input type="checkbox"/> |
| 7) | <input type="checkbox"/> | <input type="checkbox"/> |



ਕਰਾਈ 3

ਹਾਂ ਨਹੀਂ

- | | | |
|----|--------------------------|--------------------------|
| 1) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) | <input type="checkbox"/> | <input type="checkbox"/> |
| 6) | <input type="checkbox"/> | <input type="checkbox"/> |



ਕਰਾਈ 2

ਹਾਂ ਨਹੀਂ

- | | | |
|----|--------------------------|--------------------------|
| 1) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) | <input type="checkbox"/> | <input type="checkbox"/> |
| 6) | <input type="checkbox"/> | <input type="checkbox"/> |
| 7) | <input type="checkbox"/> | <input type="checkbox"/> |



ਕਰਾਈ 4

ਹਾਂ ਨਹੀਂ

- | | | |
|----|--------------------------|--------------------------|
| 1) | <input type="checkbox"/> | <input type="checkbox"/> |
| 2) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5) | <input type="checkbox"/> | <input type="checkbox"/> |
| 6) | <input type="checkbox"/> | <input type="checkbox"/> |
| 7) | <input type="checkbox"/> | <input type="checkbox"/> |



ਕਰਾਈ 5

	ਹਾਂ	ਨਹੀਂ
1)	<input type="checkbox"/>	<input type="checkbox"/>
2)	<input type="checkbox"/>	<input type="checkbox"/>
3)	<input type="checkbox"/>	<input type="checkbox"/>
4)	<input type="checkbox"/>	<input type="checkbox"/>
5)	<input type="checkbox"/>	<input type="checkbox"/>
6)	<input type="checkbox"/>	<input type="checkbox"/>



ਕਰਾਈ 6

	ਹਾਂ	ਨਹੀਂ
1)	<input type="checkbox"/>	<input type="checkbox"/>
2)	<input type="checkbox"/>	<input type="checkbox"/>
3)	<input type="checkbox"/>	<input type="checkbox"/>
4)	<input type="checkbox"/>	<input type="checkbox"/>
5)	<input type="checkbox"/>	<input type="checkbox"/>
6)	<input type="checkbox"/>	<input type="checkbox"/>

Pseudo Reading in Punjabi

ਗੈਰ - ਸ਼ਬਦ ਪ੍ਰੀਖਿਆ

ਦੋਹਰਾਈ - ਨਿਰਦੇਸ਼ ਇੱਕ ਵਾਰ ਦੁਹਰਾਇਆ ਜਾ ਸਕਦਾ ਹੈ ।

ਸਹਾਇਕ ਸਾਮਗਰੀ - ਗੈਰ ਸ਼ਬਦ ਪ੍ਰੋਤਸਾਹਨ ਸ਼ੀਟ ।

ਹਰ ਇੱਕ ਪ੍ਰਸੰਸਾਯੋਗ ਜਵਾਬ ਲਈ 1, ਗਲਤ ਜਵਾਬ ਲਈ 0 ਅਤੇ ਕੋਈ ਜਵਾਬ ਨਹੀਂ ਲਈ, ਕੋਈ ਜਵਾਬ ਨਹੀਂ ਨੂੰ ਗੋਲਾ ਲਗਾਓ । ਇੱਕ ਪ੍ਰਸੰਸਾਯੋਗ ਪ੍ਰਤੀਕਰਮ ਕਿਸੇ ਵੀ ਤਾਰਕਿਕ ਵਰਤਨੀ ਤੋਂ ਪ੍ਰਾਪਤ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ। ਜੇਕਰ ਤੁਸੀਂ ਪ੍ਰਤੀਕਰਮਾਂ ਨੂੰ ਲਿਖਣਾ ਚਾਹੁੰਦੇ ਹੋ ਤਾਂ ਉਸਦੇ ਲਈ ਜਗ੍ਹਾ ਦਿੱਤੀ ਗਈ ਹੈ । ਸਾਰਿਆਂ ਪ੍ਰਤੀਕਰਮਾਂ ਨੂੰ ਪ੍ਰਤੀਲੇਖਨ ਦੀ ਸੁਧਤਾ ਦੀ ਜਾਂਚ ਕਰਣ ਲਈ ਟੇਪ ਰਿਕਾਰਡ ਕਰਣਾ ਜ਼ਰੂਰੀ ਹੈ ।

ਇੱਥੇ ਕੁੱਝ ਸ਼ਬਦ ਦਿੱਤੇ ਗਏ ਹਨ । ਮੈਂ ਚਾਹੁੰਦੀ ਹਾਂ ਕਿ ਤੁਸੀਂ, ਉਨ੍ਹਾਂ ਵਿੱਚੋਂ ਜਿੰਨੇ ਪੜ੍ਹ ਸੱਕਦੇ ਹੋ ਪੜ੍ਹੋ । ਤੁਸੀਂ ਇਸ ਸ਼ਬਦਾਂ ਨੂੰ ਪਹਿਲਾਂ ਨਹੀਂ ਵੇਖਿਆ ਕਿਉਂਕਿ ਇਹ ਬਣਾਏ ਗਏ ਨੇ, ਪਰ ਮੈਂ ਚਾਹੁੰਦੀ ਹਾਂ ਕਿ ਤੁਸੀਂ ਜ਼ਿਆਦਾ ਤੋਂ ਜ਼ਿਆਦਾ ਸ਼ਬਦ ਪੜ੍ਹਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੋ ।

ਉੱਚੀਪਨ	ਪ੍ਰਤੀਲੇਖਨ	ਪ੍ਰਾਪਤਾਂਕ		
1. ਇਸ਼		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
2. ਨੁੜ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
3. ਕਾਪ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
4. ਬਾਨ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
5. ਹੈਰ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
6. ਸੁਮ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
7. ਲਾਕੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
8. ਦੇਰੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
9. ਸਾਨੋਂ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
10. ਦਿੰਸਾ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
11. ਥਾਸੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
12. ਅਰੂਰ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
13. ਸਾਰਸ਼		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
14. ਘਾਜਰ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
15. ਸ਼ੀਰੋਗ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
16. ਜੰਗਤ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
17. ਡਾਕੜਰ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
18. ਭਿਕਾਰੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
19. ਸਿੱਗਿਆ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
20. ਕੰਦਰਾ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
21. ਕੋਸ਼ਿਆਰ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
22. ਅਤਿਆਸ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
23. ਦਾਮਯਾਬ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
24. ਮੰਜਾਬੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
25. ਕੈਦਾਨੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
26. ਸੁਨਾਫਾ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
27. ਹਿੰਮਆਰਥੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
28. ਇਮਖਿਹਾਨ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
29. ਦਾਨੀਕਾਰਕ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ
30. ਯੁੱਧੀਮਾਨੀ		1	0	ਕੋਈ ਜਵਾਬ ਨਹੀ

Phonological processing-Deletion task in Punjabi

ਵਿਲੇਪਨ ਪ੍ਰੀਖਿਆ

ਸੱਮਗਰੀ: ਕੁੱਝ ਨਹੀਂ।

ਪ੍ਰਤੀਕਿਰਿਆ: ਹਰ ਅਭਿਆਸ ਮਦ ਅਤੇ, 1 ਅਤੇ 2 ਮਦਾਂ ਤੇ (ਗਲਤ ਜਾਂ ਸਹੀ ਉਤਰ ਤੇ) ਪ੍ਰਤੀਕਿਰਿਆ ਦਿਉ।

ਫਲਾਂਕਨ: ਹਰ ਸਹੀ ਉਤਰ ਲਈ 1 ਅੰਕ ਅਤੇ ਹਰ ਗਲਤ ਉਤਰ ਲਈ 0 ਅੰਕ ਦਿਉ। ਇਸ ਉਪ-ਪ੍ਰੀਖਿਆ ਦੇ ਕੁੱਲ ਪ੍ਰਾਪਤ ਅੰਕ

ਸਹੀ ਦਿੱਤੇ ਗਏ ਉਤਰਾਂ ਦੇ ਜੋੜ ਦੇ ਬਰਾਬਰ ਹੋਣਗੇ।

ਨਿਰਦੇਸ਼: ਵਿਦਿਆਰਥੀ ਨੂੰ ਇਹ ਕਹੋ ਕਿ , “ਆਉ, ਅੱਜ ਅਸੀਂ ਸ਼ਬਦਾਂ ਦਾ ਇੱਕ ਖੇਲ ਖੇਡਦੇ ਹਾਂ।”

ਅਭਿਆਸ ਮਦਾਂ

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| 1. ਬੋਲੇ ਕਮਲ। ਹੁਣ ਕਮਲ ਬਿਨਾਂ /ਕ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਮਲ |
| ਸਹੀ ਉਤਰ ਦੇਣ ਤੇ ਕਹੋ, “ਬਿਲਕੁਲ ਠੀਕ ਹੈ ਇਹ, ਆਉ ਕੁੱਝ ਹੋਰ ਸ਼ਬਦ ਬੋਲਣ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੀਏ।” | |
| ਗਲਤ ਉਤਰ ਦੇਣ ਤੇ ਕਹੋ, “ਇਹ ਠੀਕ ਨਹੀਂ ਹੈ, ਕਮਲ ਬਿਨਾਂ /ਕ/ ਦੀ ਅਵਾਜ ਦੇ ਮਲ ਹੁੰਦਾ ਹੈ।” | |
| 2. ਬੋਲੇ ਮਟਰ। ਹੁਣ ਮਟਰ ਬਿਨਾਂ /ਟ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਮਰ |
| 3. ਬੋਲੇ ਰੇਤਲਾ। ਹੁਣ ਰੇਤਲਾ ਬਿਨਾਂ /ਲ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਰੇਤਾ |

ਪ੍ਰੀਖਿਆ ਮਦਾਂ: ਹਰ ਉਤਰ ਤੇ ਪਹਿਲਾਂ ਵਾਂਗ (ਸਹੀ ਜਾਂ ਗਲਤ ਤੇ) ਪ੍ਰਤੀਕਿਰਿਆ ਦਿਉ।

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| 1. ਬੋਲੇ ਕਤਾਰ। ਹੁਣ ਕਤਾਰ ਬਿਨਾਂ /ਕ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਤਾਰ |
| 2. ਬੋਲੇ ਸਿਖਰ। ਹੁਣ ਸਿਖਰ ਬਿਨਾਂ /ਖ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਸਿਰ |

ਬਾਕੀ ਪ੍ਰੀਖਿਆ ਮਦਾਂ: ਕਿਸੇ ਵੀ ਮਦ ਤੇ ਕੋਈ ਪ੍ਰਤੀਕਿਰਿਆ ਨਹੀਂ ਦੇਣੀ।

ਅੰਕ(1/0)

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| 3. ਬੋਲੇ ਸੜਕ। ਹੁਣ ਸੜਕ ਬਿਨਾਂ /ਕ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਸੜ | _____ |
| 4. ਬੋਲੇ ਮਗਰ, ਹੁਣ ਮਗਰ ਬਿਨਾਂ /ਗ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਮਰ | _____ |
| 5. ਬੋਲੇ ਨਿਯਮ। ਹੁਣ ਨਿਯਮ ਬਿਨਾਂ /ਯ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਨਿਮ | _____ |
| 6. ਬੋਲੇ ਹਿੰਮਤ। ਹੁਣ ਹਿੰਮਤ ਬਿਨਾਂ /ਤ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਹਿੰਮ | _____ |
| 7. ਬੋਲੇ ਚਤੁਰਾਈ। ਹੁਣ ਚਤੁਰਾਈ ਬਿਨਾਂ /ਈ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਚਤੁਰਾ | _____ |
| 8. ਬੋਲੇ ਏਕਤਾ। ਹੁਣ ਏਕਤਾ ਬਿਨਾਂ /ਤ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਏਕਾ | _____ |
| 9. ਬੋਲੇ ਸ਼ਰਬਤ। ਹੁਣ ਸ਼ਰਬਤ ਬਿਨਾਂ /ਬ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਸ਼ਰਤ | _____ |
| 10. ਬੋਲੇ ਪੂਰਬ, ਹੁਣ ਪੂਰਬ ਬਿਨਾਂ /ਊ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਪਰਬ | _____ |
| 11. ਬੋਲੇ ਸਵੇਰਾ, ਹੁਣ ਸਵੇਰਾ ਬਿਨਾਂ /ਵ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਸਵੇਰਾ/ ਸੇਰਾ | _____ |
| 12. ਬੋਲੇ ਬਹਾਦਰੀ। ਹੁਣ ਬਹਾਦਰੀ ਬਿਨਾਂ /ਦ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਬਾਹਰੀ | _____ |
| 13. ਬੋਲੇ ਦਸਖਤ। ਹੁਣ ਦਸਖਤ ਬਿਨਾਂ /ਦ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਸਖਤ | _____ |
| 14. ਬੋਲੇ ਲੱਕੜੀ। ਹੁਣ ਲੱਕੜੀ ਬਿਨਾਂ /ੜ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਲੱਕੀ | _____ |
| 15. ਬੋਲੇ ਤ੍ਰਿਵੇਣੀ। ਹੁਣ ਤ੍ਰਿਵੇਣੀ ਬਿਨਾਂ /ਣ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਤ੍ਰਿਵ | _____ |
| 16. ਬੋਲੇ ਉਸਤਾਦ। ਹੁਣ ਉਸਤਾਦ ਬਿਨਾਂ /ਸ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਉਤਾਦ | _____ |
| 17. ਬੋਲੇ ਅਟਾਰੀ। ਹੁਣ ਅਟਾਰੀ ਬਿਨਾਂ /ਟ/ ਦੀ ਅਵਾਜ ਦੇ ਬੋਲੋ। | ਆਰੀ | _____ |

Substitution task

ਪ੍ਰਤਿਸਥਾਪਨ ਪ੍ਰੀਖਿਆ

ਸੱਮਗਰੀ: ਕੁੱਝ ਨਹੀਂ।

ਪ੍ਰਤੀਕਿਰਿਆ: ਹਰ ਅਭਿਆਸ ਮਦਾਂ ਤੇ (ਗਲਤ ਜਾਂ ਸਹੀ ਉੱਤਰ ਤੇ) ਪ੍ਰਤੀਕਿਰਿਆ ਦਿਉ।

ਫਲਾਂਕਨ: ਹਰ ਸਹੀ ਉੱਤਰ ਲਈ 1 ਅੰਕ ਅਤੇ ਹਰ ਗਲਤ ਉੱਤਰ ਲਈ 0 ਅੰਕ ਦਿਉ। ਇਸ ਉਪ-ਪ੍ਰੀਖਿਆ ਦੇ ਕੁੱਲ ਅੰਕ ਸਹੀ ਦਿੱਤੇ ਗਏ ਉੱਤਰਾਂ ਦੇ ਜੋੜ ਦੇ ਬਰਾਬਰ ਹੋਣਗੇ।

ਨਿਰਦੇਸ਼: ਵਿਦਿਆਰਥੀ ਨੂੰ ਇਹ ਕਹੋ ਕਿ, “ਆਉ, ਅੱਜ ਅਸੀਂ ਸ਼ਬਦਾਂ ਦਾ ਇੱਕ ਖੇਲ ਖੇਡਦੇ ਹਾਂ।”

ਅਭਿਆਸ ਮਦਾਂ

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| 1. ਬੋਲੇ ਖੇਤ। ਹੁਣ ਖੇਤ ਵਿੱਚ /ਖ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਚ/ ਵਿੱਚ ਬਦਲੋ। | ਚੇਤ | |
| ਸਹੀ ਉੱਤਰ ਦੇਣ ਤੇ ਕਹੋ, “ਬਿਲਕੁਲ ਠੀਕ ਹੈ ਇਹ, ਆਉ ਕੁੱਝ ਹੋਰ ਸ਼ਬਦ ਬੋਲਣ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੀਏ।” | | |
| ਗਲਤ ਉੱਤਰ ਦੇਣ ਤੇ ਕਹੋ, “ਇਹ ਠੀਕ ਨਹੀਂ ਹੈ, ਖੇਤ ਵਿੱਚ /ਖ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਚ/ ਵਿੱਚ ਬਦਲਣ ਤੋਂ ਬਾਅਦ ਇਹ ਚੇਤ ਬਣ ਜਾਵੇਗਾ।” | | |
| 2. ਬੋਲੇ ਕੀੜੀ। ਹੁਣ ਕੀੜੀ ਸ਼ਬਦ ਵਿੱਚ /ਕ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਪ/ ਵਿੱਚ ਬਦਲੋ। | ਪੀੜੀ | |
| 3. ਬੋਲੇ ਛੱਪੜ। ਹੁਣ ਛੱਪੜ ਸ਼ਬਦ ਵਿੱਚ /ੜ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਰ/ ਵਿੱਚ ਬਦਲੋ | ਛੱਪਰ | |
| 4. ਪ੍ਰੀਖਿਆ ਮਦਾਂ: ਕਿਸੇ ਵੀ ਮਦ ਤੇ ਕੋਈ ਪ੍ਰਤੀਕਿਰਿਆ ਨਹੀਂ ਦੇਣੀ। | | ਅੰਕ(1/0) |
| 5. ਬੋਲੇ ਪਰ। ਹੁਣ ਪਰ ਵਿੱਚ /ਪ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਕ/ ਵਿੱਚ ਬਦਲੋ | ਕਰ | _____ |
| 6. ਬੋਲੇ ਲੇਰੀ। ਹੁਣ ਲੇਰੀ ਵਿੱਚ /ਲ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਗ/ ਵਿੱਚ ਬਦਲੋ। | ਗੇਰੀ | _____ |
| 7. ਬੋਲੇ ਸੇਟੀ। ਹੁਣ ਸੇਟੀ ਵਿੱਚ /ਟ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਚ/ ਵਿੱਚ ਬਦਲੋ। | ਸੇਚੀ | _____ |
| 8. ਬੋਲੇ ਰਾਜਾ। ਹੁਣ ਰਾਜਾ ਵਿੱਚ /ਆ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਏ/ ਵਿੱਚ ਬਦਲੋ। | ਰਾਜੇ | _____ |
| 9. ਬੋਲੇ ਝਾਕੀ। ਹੁਣ ਝਾਕੀ ਵਿੱਚ /ਝ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਹ/ ਵਿੱਚ ਬਦਲੋ | ਹਾਕੀ | _____ |
| 10. ਬੋਲੇ ਸੰਦੂਕ। ਹੁਣ ਸੰਦੂਕ ਵਿੱਚ /ਸ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਬ/ ਵਿੱਚ ਬਦਲੋ। | ਬੰਦੂਕ | _____ |
| 11. ਬੋਲੇ ਅਨੰਦ। ਹੁਣ ਅਨੰਦ ਵਿੱਚ /ਦ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਤ/ ਵਿੱਚ ਬਦਲੋ | ਅਨੰਤ | _____ |
| 12. ਬੋਲੇ ਗੁਲਾਮ। ਹੁਣ ਗੁਲਾਮ ਵਿੱਚ /ਮ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਬ/ ਵਿੱਚ ਬਦਲੋ | ਗੁਲਾਬ | _____ |
| 13. ਬੋਲੇ ਉੱਤਰ। ਹੁਣ ਉੱਤਰ ਵਿੱਚ /ਰ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਮ/ ਵਿੱਚ ਬਦਲੋ | ਉੱਤਮ | _____ |
| 14. ਬੋਲੇ ਖੈਰ। ਹੁਣ ਖੈਰ ਵਿੱਚ /ਐ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਆ/ ਵਿੱਚ ਬਦਲੋ । | ਖਾਰ | _____ |
| 15. ਬੋਲੇ ਪ੍ਰਭਾਤੀ। ਹੁਣ ਪ੍ਰਭਾਤ ਵਿੱਚ /ਭ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਜ/ ਵਿੱਚ ਬਦਲੋ। | ਪ੍ਰਜਾਤੀ | _____ |
| 16. ਬੋਲੇ ਨਿਰਾਲਾ। ਹੁਣ ਨਿਰਾਲਾ ਵਿੱਚ /ਲ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਸ/ ਵਿੱਚ ਬਦਲੋ। | ਨਿਰਾਸ਼ਾ | _____ |
| 17. ਬੋਲੇ ਕੁਸੈਲਾ। ਹੁਣ ਕੁਸੈਲਾ ਵਿੱਚ /ਸ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਚ/ ਵਿੱਚ ਬਦਲੋ। | ਕੁਚੈਲਾ | _____ |
| 18. ਬੋਲੇ ਸਰਦਾਰ। ਹੁਣ ਸਰਦਾਰ ਵਿੱਚ /ਦ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਕ/ ਵਿੱਚ ਬਦਲੋ। | ਸਰਕਾਰ | _____ |
| 19. ਬੋਲੇ ਨਿਮਰਤਾ। ਹੁਣ ਨਿਮਰਤਾ ਵਿੱਚ /ਮ/ ਦੀ ਅਵਾਜ਼ ਨੂੰ /ਡ/ ਵਿੱਚ ਬਦਲੋ। | ਨਿਡਰਤਾ | _____ |

Orthographic Knowledge- Word matching task

ਸ਼ਬਦ ਮਿਲਾਨ ਕਾਰਜ

ਸਮਾਂ - 1 ਮਿੰਟ

ਵਿਦਿਆਰਥੀ ਦਾ ਨਾਮ / ਕੋਡ _____

ਜਮਾਤ _____

ਠੀਕ ਉੱਤਰਾਂ ਦੀ ਕੁਲ ਗਿਣਤੀ	
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ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਸ਼ਬਦਾਂ ਦੇ ਜੋੜੇ ਧਿਆਨ ਨਾਲ ਪੜ੍ਹੋ । ਜੋ ਜੋੜੇ ਇੱਕ ਜਿਹੇ ਹਨ ਉਹਨਾਂ ਦੇ ਹੇਠਾਂ ਲਕੀਰ ਲਗਾਓ।

ਉਦਾਹਰਨ

ਭਾਂਡਾ : ਭਾਂਡਾ

ਚਾਟੀ : ਪਾਟੀ

1. ਡਰ : ਡਰ

2. ਚਾਹ : ਰਾਹ

3. ਆਸ : ਪਾਸ

4. ਬੇਰ : ਬੇਰ

5. ਹੁਣ : ਹੁਣ

6. ਤਨ : ਮਨ

7. ਸਿਰ : ਸਿਰ

8. ਦੁਖ : ਸੁਖ

9. ਸੁਰ : ਸੌਰ

10. ਰਾਤ : ਰਾਤ

11. ਪਾਥੀ : ਪੇਥੀ

12. ਪਾਣੀ : ਪਾਣੀ

13. ਮਿਤੀ : ਮਿਤੀ

14. ਮੈਲਾ : ਮੇਲਾ

15. ਮੁੱਕਾ : ਚੁੱਕਾ

16. ਬੁਰਾ : ਬੁਰਾ

17. ਥਾਲ : ਭਾਲ

18. ਚੇਗਾ : ਚੰਗਾ

19. ਜਾਣਾ : ਆਣਾ

20. ਔਰਤ : ਔਰਤ

21. ਝੰਡਾ : ਝੰਡਾ

22. ਪੌੜੀ : ਪਾੜੀ

23. ਲੱਸੀ : ਲੱਸੀ

24. ਸਲਾਦ : ਸਲਾਦ

25. ਮੁੰਡੇ : ਮੁੰਡੇ

26. ਬਾਲਕ : ਬਾਲਕ

27. ਉਡਾਰੀ : ਖਿਡਾਰੀ

28. ਸੁਲੇਖਾ : ਭੁਲੇਖਾ

29. ਵਪਾਰੀ : ਵਪਾਰੀ

30. ਪੁਰਾਣੀ : ਪੁਰਾਣੀ

31. ਪਟਾਰੀ : ਅਟਾਰੀ

32. ਗਿਆਨੀ : ਮਿਆਨੀ

33. ਇਕੱਠੇ : ਇਕੱਠਾ

34. ਦੁਨੀਆਂ : ਦੁਨੀਆਂ

35. ਸੰਸਾਰੀ : ਪੰਸਾਰੀ

36. ਪ੍ਰਕਾਸ਼ਣ : ਪ੍ਰਕਾਸ਼ਣ

37. ਕੁਸੈਲਾ : ਗੁਸੈਲਾ

38. ਸਤਰੰਗ : ਸਤਰੰਗ

39. ਪ੍ਰਬੰਧ : ਪ੍ਰਬੰਧ

40. ਹਜ਼ਾਰਾਂ : ਬਜ਼ਾਰਾਂ

41. ਸਤਿਕਾਰ : ਸਤਿਕਾਰ

42. ਤ੍ਰਿਕਾਲਾਂ : ਤ੍ਰਿਕਾਲਾਂ

43. ਟਹਿਕੀਏ : ਮਹਿਕੀਏ

44. ਪ੍ਰਾਰਥਨਾ : ਪ੍ਰਾਰਥਨਾ

45. ਨਿਆਰਿਆਂ : ਪਿਆਰਿਆਂ
46. ਉਦਾਹਰਨ : ਉਦਾਹਰਨ
47. ਕੁਰਬਾਨੀ : ਗੁਰਬਾਨੀ
48. ਵਾਤਾਵਰਣ : ਵਾਤਾਵਰਣ

49. ਚਮਤਕਾਰ : ਚਮਤਕਾਰ
50. ਸ਼ਾਕਾਹਾਰੀ : ਮਾਸਾਹਾਰੀ

Non-word matching task

ਗੈਰ-ਸ਼ਬਦ ਮਿਲਾਨ ਕਾਰਜ

ਸਮਾਂ - 1 ਮਿੰਟ

ਵਿਦਿਆਰਥੀ ਦਾ ਨਾਮ / ਕੋਡ

ਜਮਾਤ.....

ਠੀਕ ਉੱਤਰਾਂ ਦੀ ਕੁਲ ਗਿਣਤੀ

ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਗੈਰ-ਸ਼ਬਦਾਂ ਦੇ ਜੋੜੇ ਧਿਆਨ ਨਾਲ ਪੜ੍ਹੋ। ਜੇ ਜੋੜੇ ਇੱਕ ਜਿਹੇ ਹਨ ਉਨ੍ਹਾਂ ਦੇ ਹੇਠਾਂ ਲਕੀਰ ਲਗਾਓ।

ਉਦਾਹਰਨ

ਭਾਂਚਾ : ਭਾਂਚਾ

ਸੈਟੀ : ਲੈਟੀ

1. ਢਰ : ਢਰ
2. ਜੁਣ : ਜੇਣ
3. ਕਊ : ਕਊ
4. ਤੂਬ : ਕੂਬ
5. ਹਾਤ : ਹੇਤ
6. ਕਾਹ : ਕਾਹ
7. ਮੇਬ : ਕੇਬ
8. ਚੇਡ : ਚੇਡ
9. ਫਾਜ : ਪਾਜ
10. ਮੈਠ : ਮੈਠ
11. ਦੇਪੀ : ਦੇਪੀ
12. ਪਾਫੀ : ਪਾਫੀ
13. ਤਿੱਠੇ : ਨਿੱਠੇ
14. ਚਾਈ : ਚਾਈ
15. ਤੇਟੀ : ਤੇਟੀ
16. ਸਤੂਲ : ਸਦੂਲ
17. ਪਰੀਰ : ਤਰੀਰ
18. ਟਾਗੇ : ਟਾਗੇ
19. ਤਹਾਨ : ਪਹਾਨ
20. ਜਿਖਾ : ਜਿਖੇ

21. ਹੀੜੀ : ਹੋੜੀ
22. ਤਿਰਤ : ਤਿਰਤ
23. ਪਿਰਨ : ਪੇਰਨ
24. ਕ੍ਰਾਨੀ : ਸ੍ਰਾਨੀ
25. ਸਿਤਾਬ : ਸਿਤੁਬ
26. ਇਪਈ : ਏਪਈ
27. ਨਮਾਈ : ਨਮਾਈ
28. ਰਿਚਾਰੀ : ਰਿਚਾਰਾ
29. ਟੜਾਈ : ਟੜਾਈ
30. ਬੋਰਤ : ਪੋਰਤ
31. ਜੁਨੀਆਂ : ਜੁਨੀਆ
32. ਤਾਕੀਆ : ਤੇਕੀਆ
33. ਕਿਡਾਰੀ : ਜਿਡਾਰੀ
34. ਤਿੱਖਿਆ : ਤਿੱਖਿਆ
35. ਹਾਲਕੀ : ਠਾਲਕੀ
36. ਤਹਾਰਾਜ : ਬਹਾਰਾਜ
37. ਚਲਾਕਾਰ : ਚਲਾਕਾਰ
38. ਸਿਹਨਤ : ਸਿਹਨਤ
39. ਟਰਕਾਰ : ਟਰਕਾਰ
40. ਕਹੂਲਤ : ਕਹੈਲਤ

41. ਨੁਦਰਤ : ਨੇਦਰਤ
42. ਹਿਵਾਲੀ : ਹਿਵਾਲੀ
43. ਪਰਾਉਆ : ਪਰਾਉਆ
44. ਰਠਿਆਈ : ਰਠਿਆਈ
45. ਹੁਝਾਰਤਾਂ : ਰੁਝਾਰਤਾਂ
46. ਕਰਾਮਾਤੀ : ਕਰਾਮਾਤੀ
47. ਇਣਹੋਈ : ਆਣਹੋਈ
48. ਪਾਤਾਵਰਨ : ਪਾਤਾਵਰਨ
49. ਹੰਕਾਤਿਆ : ਹੰਕਾਠਿਆ
50. ਸਾਈਬ੍ਰੇਰੀ : ਰਾਈਬ੍ਰੇਰੀ

Word chain task-Punjabi

ਸ਼ਬਦ ਲੜੀ ਕਾਰਜ

ਸਮਾਂ - 1 ਮਿੰਟ

ਵਿਦਿਆਰਥੀ ਦਾ ਨਾਮ / ਕੋਡ

ਜਮਾਤ.....

ਨੀਕ ਉੱਤਰਾਂ ਦੀ ਕੁਲ ਗਿਣਤੀ	
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ਹੇਠਾਂ ਦਿੱਤੀ ਗਈ(1-10) ਹਰ ਇੱਕ ਕਤਾਰ ਵਿੱਚੋਂ ਸ਼ਬਦ ਲੱਭਣ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੋ। ਧਿਆਨ ਰਹੇ, ਕਿ ਸ਼ਬਦਾਂ ਵਿੱਚਲੀ ਦੂਰੀ ਨੂੰ ਘੱਟ ਕਰ ਦਿੱਤਾ ਗਿਆ ਹੈ ਪਰ ਤੁਸੀਂ ਸ਼ਬਦਾਂ ਨੂੰ ਲਭਣਾ ਹੈ ਅਤੇ ਇਨ੍ਹਾਂ ਦੇ ਵਿੱਚ ਇੱਕ ਸਿੱਧੀ ਰੇਖਾ ਲਾ ਕੇ ਇਨ੍ਹਾਂ ਨੂੰ ਵੱਖ ਕਰਣਾ ਹੈ। ਰੇਖਾ ਲਗਾਉਣ ਦੇ ਬਾਅਦ ਤੁਹਾਨੂੰ ਸ਼ਬਦ ਦੁਬਾਰਾ ਲਿਖਣ ਦੀ ਜ਼ਰੂਰਤ ਨਹੀਂ ਹੈ।

ਉਦਾਹਰਨ - ਚਿੜੀਝਾਕੀਛੱਤਹਾਥੀ

ਚਿੜੀ/ਝਾਕੀ/ਛੱਤ/ਹਾਥੀ

1. ਦਿਨਤੰਦਰੁਸਤਸੂਰਜਲਕੱਤਜਗ
2. ਬਾਤਗੁਲਾਬਜੀਵਨਕਬੂਤਰਕਿਲਕਾਰੀਆਂ
3. ਚੰਗਾਸਰੀਰਸਤਿਕਾਰਬੇਰ
4. ਗੋਲਨਿਸ਼ਾਨਾਬੱਦਲਚੁਫੇਰਾਲਾਲ
5. ਅੰਬਸੀਸਭਾਰਤਸਾਵਧਾਨ
6. ਖਰਗੋਸ਼ਕੁਦਰਤਬਸੇਰਾਬੱਚੇਸ਼ਹੀਦੀਹਟ
7. ਨਾਲਚੁਚੇਰੇਟੀਸਵੇਰਸਫਲਤਾਹਨੇਰਾ
8. ਦੁਕਾਨਬੈਠਾਤਸਵੀਰਦਾਣਾਵੱਧ
9. ਰਾਣੀਸੂਰਬੀਰਸ਼ਰਬਤਝੂਟਾਡਰ
10. ਗੁਜਾਰਾਭਾਂਡਾਸਾਫ਼ਝੱਗਾਲੜਾਈ

Sentence chain task in Punjabi

ਵਾਕ ਲੜੀ ਕਾਰਜ

ਸਮਾਂ - 1 ਮਿੰਟ

ਵਿਦਿਆਰਥੀ ਦਾ ਨਾਮ/ਕੋਡ _____

ਜਮਾਤ _____

ਠੀਕ ਉੱਤਰਾਂ ਦੀ ਕੁਲ ਗਿਣਤੀ	
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ਹੇਠਾਂ ਦਿੱਤੀ ਗਈ(1-10) ਹਰ ਇੱਕ ਕਤਾਰ ਵਿੱਚੋਂ ਸ਼ਬਦ ਲੱਭਣ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰੋ। ਧਿਆਨ ਰਹੇ, ਕਿ ਸ਼ਬਦਾਂ ਵਿੱਚਲੀ ਦੂਰੀ ਨੂੰ ਘੱਟ ਕਰ ਦਿੱਤਾ ਗਿਆ ਹੈ ਪਰ ਤੁਸੀਂ ਸ਼ਬਦਾਂ ਨੂੰ ਲੱਭਣਾ ਹੈ ਅਤੇ ਇਨ੍ਹਾਂ ਦੇ ਵਿੱਚ ਇੱਕ ਸਿੱਧੀ ਲਾਈਨ ਲਾ ਕੇ ਇਨ੍ਹਾਂ ਨੂੰ ਵੱਖ ਕਰਣਾ ਹੈ। ਲਾਈਨ ਲਗਾਉਣ ਦੇ ਬਾਅਦ ਤੁਹਾਨੂੰ ਸ਼ਬਦ ਦੁਬਾਰਾ ਲਿਖਣ ਦੀ ਜ਼ਰੂਰਤ ਨਹੀਂ ਹੈ।

ਉਦਾਹਰਨ - ਪਾਣੀਬਹੁਤਕੀਮਤੀਹੈ।

ਪਾਣੀ/ਬਹੁਤ/ਕੀਮਤੀ/ਹੈ।

1. ਪੰਛੀਚਹਿਕਰਹੇਸਨ।
2. ਛੱਤਉੱਤੇਬਹੁਤਹਨੇਰਾਸੀ।
3. ਰਾਹੀਰਾਹਲੱਭਰਿਹਾਸੀ।
4. ਉਸਕੋਲਸੱਤਕਬੂਤਰਸਨ।
5. ਗੋਭੀਦੀਸਬਜੀਬਣੀਹੋਈਸੀ।
6. ਸ਼ਹਿਦਸਿਹਤਲਈਚੰਗਾਹੈ।
7. ਫੌਜੀਦੇਸ਼ਲਈਜਾਨਦਿੰਦੇਹਨ।
8. ਭੋਲਾਂਹੋਗੀਤਿੰਨਭੈਣਭਰਾਹਨ।
9. ਰਾਣੀਨੂੰਕਿਤਾਬਾਂਲੈਣਦਾਸ਼ੋਕਹੈ।
10. ਡਾਕਟਰਨੇਸੋਚਸਮਝਕੇਦਵਾਈਦਿੱਤੀ।

RAN Objects

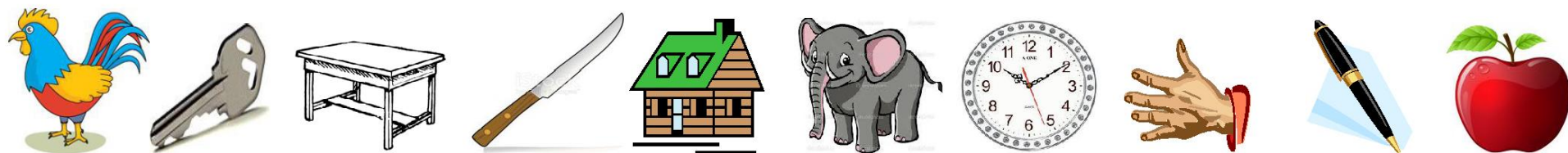
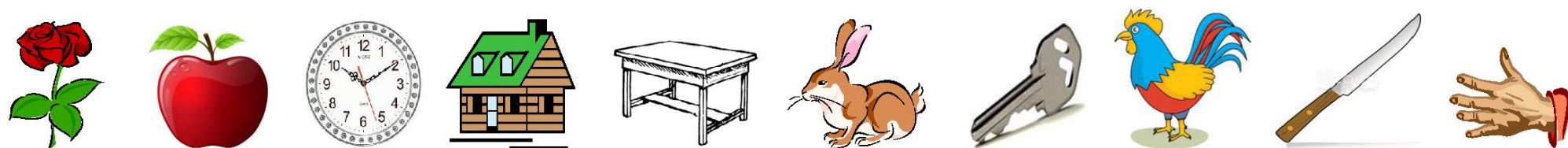
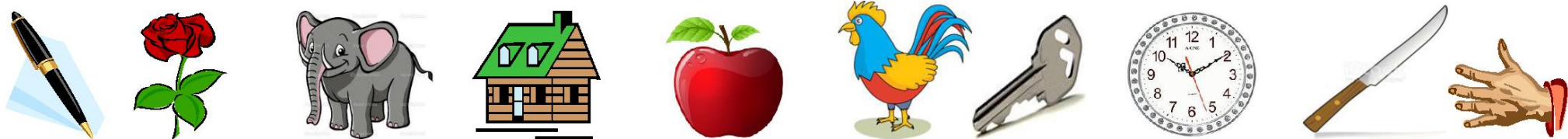
ਵਸਤਾਂ ਦਾ ਤੇਜੀ ਨਾਲ ਆਪਣੇ ਆਪ ਨਾਮਕਰਣ

ਅਭਿਆਸ

ਹੇਠਾਂ ਦਿੱਤਿਆ ਗਈਆਂ ਵਸਤਾਂ ਦੀਆਂ ਤਸਵੀਰਾਂ ਨੂੰ ਧਿਆਨ ਖੱਬੇ ਤੋਂ ਸੱਜੇ ਦੇਖੋ ਅਤੇ ਇਹਨਾਂ ਵਸਤਾਂ ਦੇ ਨਾਮ ਦਸੋ।



ਅਗਲੇ ਪੇਜ ਤੇ ਇਹਨਾਂ ਵਸਤਾਂ ਨੂੰ ਦੁਬਾਰਾ ਖੱਬੇ ਪਾਸੇ ਤੋਂ ਸ਼ੁਰੂ ਕਰ ਕੇ ਇਹਨਾਂ ਨੂੰ ਜਿਨੀ ਤੇਜੀ ਨਾਲ ਬਿਨਾਂ ਰੁਕੇ ਪੜ੍ਹ ਸਕਦੇ ਹੋ ਪੜ੍ਹੋ।



Appendix D Hindi Measures

Reading Comprehension

पठनबोध परीक्षण (बहुविकल्पी प्रश्न)

नाम/कोड.....

कक्षा.....

नीचे दिये गई हर कहानी को ध्यान से पढ़ो। उसके बाद दिये गये हर एक प्रश्न को ध्यान से पढ़ो और दिये गये विकल्पों में से सही विकल्प चुन कर उत्तर दो।

अभ्यास कहानी

राधा के पास बहुत से खिलौने हैं। वह उन्हें एक बड़े बक्से में रखती है। परन्तु सोने के समय उसे सबसे ज्यादा खिलौना भालू पसन्द हैं।

1) यह कहानी किस के बारे में थी

1. बक्से के

2. खेल के

3. मनपसन्द खिलौने के

4. खिलौनों के

2) राधा अपने सारे खिलौने कहाँ रखती है

1. बक्से में

2. अलमारी में

3. फर्श पर

4. सोफे पर

3) रात को सोते समय राधा को कौन सा खिलौना पसन्द है

1. गुड़िया

2. जीप

3. कुत्ता

4. भालू

4) आप क्या सोचते हैं कि भालू सोने के समय अच्छा खिलौना क्यों है

1. क्योंकि यह सस्ता है

2. क्योंकि यह डर से बचाता है

3. क्योंकि यह बोलता है

4. क्योंकि यह खेलता है

एक पक्षी (स्तर 1)

एक मादा पक्षी लगंड़ाते हुये मेरी खिड़की पर आई। मैंने उसे रोटी का टुकड़ा दिया। उसने मेरे बगीचे में अपना घोंसला बना लिया। अब मैं उसके बच्चों की देखभाल करता करता/करती हूँ।

1) पक्षी कुलांच मारते कहां पर आई?

1. मेरे दरवाजे पर

2. मेरे कमरे में

3. मेरी खिड़की पर

4. मेरी अलमारी पर

2) छोटे लड़के लड़की ने पक्षी को क्या दिया?

1. फल का टुकड़ा

2. रोटी का टुकड़ा

3. ब्रेड का टुकड़ा

4. मांस का टुकड़ा

3) मादा पक्षी ने बगीचे में क्या किया?

1. उड़ने लगी

2. बोलने लगी

3. घोंसला बना लिया

4. खेलने लगी

4) छोटा/छोटी लड़का/लड़की अब पक्षी के.....

1. लिये खाना लाता/लाती है।

2. साथ खेलता/खेलती है।

3. पीछे भागता/भागती है।

4. बच्चों की देखभाल करता/करती है।

सड़क सुरक्षा (स्तर 2)

रानी स्कूल जाते हुये रास्ते में एकदम रुक गई। यातायात के मध्य में दो बच्चे गिर पड़े। उनके साइकिल आपस में टकरा गये थे। रानी जल्दी से सहायता करने के लिये भागी। उसने देखा कि किसी को भी चोट नहीं आई थी। बच्चों ने टेलीविज़न कैमरे की तरफ इशारा किया। “हम सड़क सुरक्षा के पाठ में भाग ले रहे हैं”। उन्होंने कहा।

1) रानी कहां जा रही थी?

1. घर

3. कॉलेज

2. मंदिर

4. स्कूल

2) रानी क्यों रुकी?

1. भीड़ देख कर

3. आदमी को देख कर

2. दुर्घटना देख कर

4. बस को देख कर

3) बच्चों के साइकिलों को क्या हुआ था?

1. खराब हो गये

3. आपस में टकरा गये

2. तेज भागने लगे

4. चोरी हो गये

4) आप क्या सोचते हो कि रानी को क्या महसूस हो रहा था?

1. चिंता और डर

3. खुशी

2. शांति

4. निराशा

5) वास्तव में बच्चे क्या कर रहे थे?

1. पढ़ रहे थे

3. टेलीविज़न कार्यक्रम में भाग ले रहे थे

2. भाग रहे थे

4. खेल रहे थे

6) रानी को कैसे पता चला कि क्या हो रहा था?

1. लोगों ने कैमरे की तरफ इशारा किया

2. बच्चों ने कैमरे की तरफ इशारा किया

3. टेलीविज़न वालों कैमरे की तरफ इशारा किया

4. बस चालक ने कैमरे की तरफ इशारा किया

अली (स्तर 3)

जैसे ही अली ने एक पुराने मंदिर में शरण ली, उसका कन्धा एक गुप्त कमानी से टकरा गया। तुरन्त वह एक तहखाने में गिर गया। अन्धेरे में दीवारें जवाहरात से ढकी हुई लग रही थी। अली ने थोड़ी देर आराम किया, उसे पता था कि वीरान रास्तों के यात्री अक्सर अनोखी बस्तुओं की कल्पना करते हैं। बाद में, वह वहां से बाहर निकलने का रास्ता खोजने लगा। वह एकदम अचंभित हो गया, जवाहरात अब भी वहीं थे। उसे बहुत समय पहले दफनाया हुआ एक खजाना मिल गया था।

- 1) अली मंदिर में क्यों गया?
 1. छिपने के लिये
 2. पूजा करने के लिये
 3. शरण लेने के लिये
 4. पूजारी को मिलने के लिये
- 2) अली को गुप्त कमानी कैसे मिली?
 1. उसका पैर टकराने से
 2. उसका कन्धा टकराने से
 3. उसका हाथ टकराने से
 4. उसका सिर टकराने से
- 3) क्या हुआ जब अली ने कमानी को छूआ?
 1. कमानी गिर गई
 2. कमानी घूम गई
 3. अली घूम गया
 4. अली तहखाने में गिर गया
- 4) अली ने वहां क्या देखा?
 1. जवाहरात
 2. तस्वीरें
 3. सन्दूक
 4. कीमती कपड़े
- 5) अली को जवाहरात देखने की उत्सुकता नहीं थी क्योंकि
 1. उसने सोचा यह असली हैं
 2. उसने सोचा यह सिर्फ उसकी कल्पना है
 3. उसने सोचा यह उसके नहीं हैं
 4. उसने सोचा यह सिर्फ पत्थर हैं
- 6) आराम करने के बाद अली ने क्या खोजने की कोशिश की?
 1. खाने के लिये खाना
 2. खजाना
 3. बाहर निकलने का रास्ता
 4. रेगिस्तान
- 7) अली इतना अचंभित क्यों था?
 1. अन्धेरा देख कर
 2. पत्थर देख कर
 3. अपने आप को जिन्दा देख कर
 4. असली जवाहरात देख कर
- 8) जवाहरात वहां कैसे आये थे?
 1. अली उन्हें ले कर आया
 2. क्योंकि वह सालों पहले वहां दफना दिये गये थे
 3. चोरों ने वहां रखे थे
 4. राजा ने वहां रखे थे

अचानक घने बादल दिन के उजाले को चीरते हुये आसमान से छा गये। एक शोकाकुल रुदन सुनसान इमारत में गूँजा। बच्चें डर कर एकदम रुक गये। 'भूत' एक बच्चा धीरे से बोला। 'बकवास' दूसरे ने उत्तर दिया। तथापि, वे चौकसी के साथ उस रहस्यमयी शोर की तरफ बढ़ गये। साहस और बढ़ती हुई जिज्ञासा के साथ वे पुरानी रसोई के दरवाजे के पास पहुँच गये। लगभग बन्द होती साँसों के साथ उन्होंने उस पकड़ को छोड़ा। उन की बैटरियां अन्धेरे में दूँद रही थी। तुरन्त उनकी घबराहट और डर, दया में बदल गये। एक डरा हुआ कुत्ता दुबक कर बैठा था और रिरिया रहा था। जब कुत्ता चूहों का शिकार कर रहा था, तभी हवा के एक झोंके से दरवाजा जोर से बन्द हो गया था।

- 1) बच्चे कहां पर थे?
 1. बाग में
 2. कमरे में
 3. सड़क पर
 4. सुनसान इमारत में
- 2) अचानक किस कारण बच्चों को रास्ता दिखना बन्द हो गया था?
 1. घने काले बादलों के कारण
 2. शोर के कारण
 3. डर के कारण
 4. बिजली के कारण
- 3) किस चीज ने उन्हें अचानक रोका?
 1. डर ने
 2. कुछ गिरने की आवाज ने
 3. शोकाकुल रुदन ने
 4. भूत ने
- 4) उस परिस्थिति में बच्चों ने क्या किया?
 1. चौकसी से उस शोर की तरफ बढ़ गये
 2. भाग गये
 3. डर कर वहीं खड़े रहे
 4. चीखने लगे
- 5) वह शोर कहां से आ रहा था?
 1. कमरे में से
 2. स्नानघर में से
 3. मंदिर में से
 4. पुरानी रसोई में से
- 6) बच्चों को छानबीन के बाद पुरानी रसोई में क्या मिला?
 1. भूत
 2. डरा हुआ कुत्ता, जो वहां बंद हो गया था।
 3. छुपा हुआ था।
 4. भौंक रहा था।
- 7) कुत्ता वहां क्या कर रहा था?
 1. चूहों का शिकार कर रहा था।
- 8) बच्चों को उस पर दया क्यों आ रही थी?
 1. क्योंकि वह भूखा था
 2. क्योंकि वह बीमार था
 3. क्योंकि वह डरा हुआ था और बाहर नहीं निकल पा रहा था
 4. क्योंकि वह भूखा था

Listening Comprehension

श्रवणबोध परीक्षण

नाम/कोड.....

कलास.....

नमस्कार बच्चों, परीक्षण के इस भाग में आपको छः लेखांश सुनाये जायेंगे। हर एक लेखांश के बाद कुछ प्रश्न पढ़े जायेंगे। आपको हर एक लेखांश और प्रश्न ध्यान से सुनने हैं। फिर अपनी उत्तर शीट पर चिन्ह लगायें। पर याद रहे कि “हाँ” उत्तर के लिये ग्रे बॉक्स पर और “नहीं” उत्तर के लिये सफेद बॉक्स पर चिन्ह लगाना है।

अभ्यास कहानी

खरगोश धरती में बिल बना कर रहते हैं। यह बिल धरती में काफी गहरे होते हैं। खरगोश अपने पैरों से खोद कर बिल बनाते हैं। बिल ज्यादा बड़ा नहीं होता, क्योंकि खरगोश का आकार भी बहुत ज्यादा बड़ा नहीं होता। एक कुत्ता इसमें नहीं आ सकता। जब कुत्ता खरगोश के पीछे भागता है, खरगोश अपनी बिल में घुस जाता है।

अब आपको दो प्रश्न पढ़ कर सुनाये जायेंगे। आप अपनी उत्तर पत्रिका पर चिन्ह लगायें। याद रहे कि “हाँ” उत्तर के लिये ग्रे बॉक्स पर और “नहीं” उत्तर के लिये सफेद बॉक्स पर चिन्ह लगाना है। यह अवश्य निश्चित कर ले कि ठीक बॉक्स पर ही चिन्ह लगायें।

प्रश्न न. 1) क्या खरगोश अपने बिल पैरों से बनाते हैं?

प्रश्न न. 2) क्या कुत्ता खरगोश के बिल में रह सकता है?

अब पहली कहानी सुनने के लिये तैयार हो जायें

कहानी 1- सोने का पदक

पिछले सप्ताह हमारे शहर के दो बच्चों को सोने के पदक, एक छोटे लड़के को डुबने से बचाने के लिये मिले। वह छोटा लड़का तालाब के पास अपने कुत्ते के साथ खेल रहा था। तभी कुत्ता पानी एक बतख को पकड़ने के लिये तालाब में कूद गया। छोटा लड़का भी कुत्ते के पीछे जाना चाहता था। इसलिये वह भी उसके पानी में उतर गया। उसके रबड़ के जूतों में पानी भर गया। छोटा लड़का उन्हें उतारने के लिये तालाब में बैठ गया और पानी उसके सिर के उपर चला गया। सौभाग्य से, दो बड़े बच्चे वहां नजदीक थे। उन्होंने भाग कर उसे पानी से बाहर निकाला और घर ले गये।

प्रश्न न. 1) क्या दो बच्चों को सोने के पदक इनाम में मिले थे?

प्रश्न न. 2) क्या बच्चों को पदक छोटे लड़के को गाड़ी के नीचे आने से बचाने के लिये मिले थे?

प्रश्न न. 3) क्या छोटे लड़के ने रबड़ के जूते पहने थे?

प्रश्न न. 4) क्या छोटे लड़का कुत्ते के साथ खेल रहा था?

प्रश्न न. 5) क्या दो बड़े बच्चे तालाब से दूर थे?

प्रश्न न. 6) क्या छोटे लड़का जूते उतारने के लिये तालाब में बैठ गया था?

प्रश्न न. 7) क्या बड़े बच्चे उसे पानी से निकाल कर अस्पताल ले गये थे?

अब अगली कहानी सुनो।

कहानी 2- भाग्यशाली लोमड़ी

एक बड़ी भूरे रंग की लोमड़ी धीरे से जली हुई झाड़ी से कुलांच मारते हुये जमीन को सूँघ रही थी। अपने आखिरी बार खाये हुये चारे के बारे में सोच कर लोमड़ी के पेट में गड़गड़ाहट हो गई। यह उसके नदी पार करने और थक कर सो जाने से पहले था। कल रात आसमान से बिजली गिरने के कारण सभी जानवरों को आग से बचना पड़ा। लोमड़ी भूखी थी। अचानक उसे मदहोश कर देने वाली जानी-पहचानी गंध आई, क्या यह जामुन थे? वह खूशबू लोमड़ी को एक गिरे हुये पेड़ तक ले गई थी।

प्रश्न न. 1) क्या झाड़ी जली हुई थी?

प्रश्न न. 2) क्या लोमड़ी का पेट दर्द कर रहा था?

प्रश्न न. 3) क्या लोमड़ी भूखी थी?

प्रश्न न. 4) क्या लोमड़ी जमीन को खाना ढूँढने के लिये सूँघ रही थी?

प्रश्न न. 5) क्या लोमड़ी ने अपना चारा नदी पार करने के बाद खाया था?

प्रश्न न. 6) क्या लोमड़ी ने जामुन ढूँढ लिये थे?

प्रश्न न. 7) क्या आप सोचते हो के लोमड़ी जामुन खाने जा रही थी?

अब अगली कहानी सुनो।

कहानी 3- रवि का बड़ा दिन

रवि पहले ही जाग चुका था। जब उसके माता जी उठने के लिये आवाज दे रहे थे। वह उत्साहित था पर साथ ही डरा हुआ भी था। छुट्टियां खत्म हो गई थी और आज उसके स्कूल का पहला दिन था। यह पहला दिन था, जब रवि मिस रोजी के खेल-स्कूल केंद्र में समय नहीं बितायेगा। स्कूल जाने की तैयारी करने के लिये रवि अपने माता-पिता के साथ खरीददारी करने गया था। उसे कुछ नये कपड़े, नया बस्ता, नये रंग और नयी पेंसिलें मिली। रवि स्कूल के बारे में चिंतित था। क्या उसे अपनी नयी कक्षा मिल जायेगी?

प्रश्न न. 1) क्या रवि उत्साहित और डरा हुआ था?

प्रश्न न. 2) क्या रवि की छुट्टियां शुरू हुई थीं?

प्रश्न न. 3) क्या स्कूल जाने से पहले रवि मिस मारिया के खेल-स्कूल में जाता था?

प्रश्न न. 4) क्या रवि को खरीददारी पर जूते, टिफिन और कलमें मिली?

प्रश्न न. 5) क्या रवि अपने नये स्कूल में अपने माता-पिता और मिस रोजी की कमी महसूस करेगा?

प्रश्न न. 6) क्या रवि अपनी नयी कक्षा की खोज को ले कर चिंतित था?

अब अगली कहानी सुनो।

कहानी 4- बहादुर वीना

वीना अपनी माँ के साथ घर के बाहर सो रही थी। तभी जंगल से, जो के उनके गांव के पास था एक नरभक्षी तेंदुआ उनके घर आ गया। वह बिना आहट किये वीना के पास पहुँचा और तुरन्त उसकी गर्दन पर बाँयी ओर से अपने मुँह में दबोचकर पूरी ताकत के साथ खींचता हुआ वहाँ से भागा। वीना डर बहुत गई तथापि उसने हिम्मत से काम लेते हुये तेंदुए के पेट और मुँह पर, लातों और हाथों से लगातार वार करने शुरू कर दिये। वह डर के मारे उसे नहीं छोड़ कर भाग गया। इतने में गांव वाले आ गये । बाद में पता चला के बीस घंटे के ऑपरेशन के बाद वीना को बचा लिया गया था।

प्रश्न न. 1) क्या जंगल वीना के घर के पास था?

प्रश्न न. 2) क्या वीना अपने घर के बाहर जाग रही थी?

प्रश्न न. 3) क्या वह जानवर नरभक्षी शेर था?

प्रश्न न. 4) क्या वीना ने तेंदुए का डट कर मुकाबला किया?

प्रश्न न. 5) क्या गांव वाले वीना को अस्पताल ले कर गये थे?

प्रश्न न. 6) क्या डॉक्टर वीना को बचा नहीं सके?

प्रश्न न. 7) क्या आप सोचते हैं कि वीना को बहादुरी का इनाम मिला होगा?

अब अगली कहानी सुनो।

कहानी 5- दिन में सपने देखना

भानू अपने बेंच पर बैठे-2 खिड़की के बाहर टकटकी लगाये हुये थी। जबकि मिस रोजी उन बच्चों के नाम की सूची पढ़ रही थी, जिनके प्रोजेक्टों ने एक स्थानीय कला-प्रदर्शनी में इनाम जीते थे। भानू ने जैसे ही दो पक्षियों को पेड़ पर घोंसला बनाते देखा वह कक्षा के बारे में बिल्कुल भूल गई। “वाह कितना मजा आये अगर मैं भी पक्षी की तरह उड़ सकती”, भानू ने सोचा। अगर मैं पक्षी होती तो सीधा इस कक्षा के बाहर उड़ कर पेड़ों के शिखर तक उड़ान भरती। अचानक भानू ने मिस रोजी को अपना नाम पुकारते सुना। भानू बहुत शर्मिदा हुई जब उसने बताया कि वह सुन नहीं रही थी। मिस रोजी ने अपनी ऐनक के शीशों के उपर से भानू को घूरा और भानू से कहा कि “आज कक्षा के बाद मुझसे मिल कर जाना”।

प्रश्न न. 1) क्या इस कहानी में भानू दिन में सपना देख रही थी?

प्रश्न न. 2) क्या भानू मिस मैरी की कक्षा में थी?

प्रश्न न. 3) क्या भानू पक्षी की तरह घोंसला बनाना चाहती थी?

प्रश्न न. 4) क्या भानू अपने किये पर शर्मिदा थी?

प्रश्न न. 5) क्या अध्यापिका ने भानू को कक्षा में पुकारा था?

प्रश्न न. 6) आपके अनुसार, क्या मिस रोजी ने बाद मिलने पर भानू को कक्षा में सचेत हो कर

बैठने के लिये कहा होगा?

अब अगली कहानी सुनो।

कहानी 6- नृत्य प्रतियोगिता के लिये विज्ञापन

नृत्य समिति सोमवार को मिली। दो सदस्य उपस्थित नहीं थे। बिल्लू पिछले हफ्ते से बीमार था, और टोनी बैठक के बारे में भूल गया और स्कूल के बाद खेलने के लिये अपने दोस्त के घर चला गया था। रात के खाने पर टोनी के पिता जी ने बताया के समिति के अध्यक्ष का फोन आया था। वह उसके ना आने का कारण पूछ रहा था और तुम्हे विज्ञापन पत्र के बारे में याद करवाने के लिये कहा है। टोनी अपने कमरे में गया और अधूरे विज्ञापन पत्र को देखा। बिल्लू ने उसकी सहायता का वायदा किया था। मंगलवार की सुबह तक विज्ञापन पत्रों को लगाने की जिम्मेदारी उन दोनों की थी। उसे समझ नहीं आ रहा था क् क्या करे? इसलिये वह बोला, “पिता जी, क्या मैं आपसे कुछ देर बात कर सकता हूँ”

प्रश्न न. 1) क्या टोनी की मुश्किल विज्ञापन पत्र तैयार ना होना थी?

प्रश्न न. 2) क्या बिल्लू और टिकू बैठक में उपस्थित नहीं थे?

प्रश्न न. 3) क्या बिल्लू घूमने जाने की वहज से बैठक में नहीं आया था?

प्रश्न न. 4) क्या टोनी रात के खाने से पहले खेलने गया था?

प्रश्न न. 5) क्या टोनी और बिल्लू ने विज्ञापन पत्र गांव मंगलवार की सुबह तक लगाने थे?

प्रश्न न. 6) क्या टोनी ने अपने पिता जी से काम को करने की सलाह ली होगी?

श्रवणबोध परीक्षण

उत्तर पत्रिका

नाम/कोड.....

कलास.....

अभ्यास कहानी



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कहानी 5

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11)	<input type="checkbox"/>	<input type="checkbox"/>
12)	<input type="checkbox"/>	<input type="checkbox"/>



कहानी 6

	हाँ	नहीं
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8)	<input type="checkbox"/>	<input type="checkbox"/>
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11)	<input type="checkbox"/>	<input type="checkbox"/>
12)	<input type="checkbox"/>	<input type="checkbox"/>

Pseudo word Reading (Decoding)

शब्द/गैर-शब्द परीक्षण

दोहराई- निर्देश एक बार दोहराया जा सकता है।

सहायक सामग्री- गैर-शब्द प्रोत्साहन शीट।

फलांकन- प्रत्येक प्रशंसनीय प्रतिक्रिया देने के लिये 1, अकल्पनीय/अप्रशंसनीय प्रतिक्रिया देने के लिये 0 और कोई जवाब नहीं देने के लिये, कोई उत्तर पर गोला लगाओ। एक प्रशंसनीय प्रतिक्रिया किसी भी तार्किक वर्तनी से प्राप्त किया जा सकता है। अगर आप प्रतिक्रियाओं को लिखना चाहते हो तो उसके लिये जगह दी गई है। सभी प्रतिक्रियाओं का प्रतिलेखन की शुद्धता की जांच करने के लिये टेप रिकॉर्ड करना जरूरी है।

आगे कुछ शब्द दिये गये हैं। मैं चाहती हूँ कि आप, उन शब्दों में से जितने शब्द पढ़ सकते हो पढ़ो। ये शब्द आपने पहले नहीं देखे क्योंकि ये बनाये गये हैं। लेकिन मैं चाहती हूँ के आप ज्यादा से ज्यादा शब्द पढ़ने की कोशिश करें।

उद्दीपन	प्रतिलेखन	प्राप्तांक		
1. झह		1	0	कोई उत्तर नहीं
2. टिर		1	0	कोई उत्तर नहीं
3. शोग		1	0	कोई उत्तर नहीं
4. ताग		1	0	कोई उत्तर नहीं
5. बिट		1	0	कोई उत्तर नहीं
6. चोन		1	0	कोई उत्तर नहीं
7. वादत		1	0	कोई उत्तर नहीं
8. होयल		1	0	कोई उत्तर नहीं
9. तोना		1	0	कोई उत्तर नहीं
10. हिता		1	0	कोई उत्तर नहीं
11. रासी		1	0	कोई उत्तर नहीं
12. तमल		1	0	कोई उत्तर नहीं
13. जगर		1	0	कोई उत्तर नहीं
14. मिखना		1	0	कोई उत्तर नहीं
15. तहान		1	0	कोई उत्तर नहीं
16. सादमी		1	0	कोई उत्तर नहीं
17. पिराया		1	0	कोई उत्तर नहीं
18. सचहरी		1	0	कोई उत्तर नहीं
19. तपनापन		1	0	कोई उत्तर नहीं
20. तारियल		1	0	कोई उत्तर नहीं
21. प्रगंध		1	0	कोई उत्तर नहीं
22. तहलाना		1	0	कोई उत्तर नहीं
23. सौलिया		1	0	कोई उत्तर नहीं
24. मुहावना		1	0	कोई उत्तर नहीं
25. बिकलता		1	0	कोई उत्तर नहीं
26. फलेरिया		1	0	कोई उत्तर नहीं
27. रगमगाना		1	0	कोई उत्तर नहीं
28. नाकाहारी		1	0	कोई उत्तर नहीं
29. हरिभाषा		1	0	कोई उत्तर नहीं
30. गलीकाएँ		1	0	कोई उत्तर नहीं

Phonological processing-Deletion Task in Hindi

विलोपन परीक्षण

सामग्री: कुछ नहीं।

प्रतिक्रिया: हर एक अभ्यास और परीक्षण मद् 1 और 2 पर (सही या गलत) प्रतिक्रिया दें।

फलांकन: हर सही उत्तर के लिये 1 अंक और गलत उत्तर के लिये 0 अंक दे। इस उप-परीक्षण के कुल अंक सही दिये गये उत्तरों का कुल के बराबर होगा।

निर्देश: छात्र से ये कहें, “आओ हम शब्दों का एक खेल खेलें।”

अभ्यास मर्दें

सही उत्तर

1. बोलो रसोई। अब रसोई बिना /र/ की आवाज के बोलो। सोई
सही उत्तर पर कहें, “बिल्कुल ठीक है। चलो अगला शब्द बोलने का प्रत्यन करें।”
गलत उत्तर पर कहें, “यह सही नहीं है। रसोई शब्द बिना /र/ की आवाज के बोलने पर सोई होता है।”
2. बोलो बाल। अब बालक बिना /क/ की आवाज के बोलो। बाल
3. बोलो फसल। अब फसल बिना /स/ की आवाज के बोलो। फल

परीक्षण मर्दें: सही या गलत प्रतिक्रिया पहले की तरह देना जारी रखें।

1. बोलो अनार। अब अनार बिना /अ/ की आवाज के बोलो नार
2. बोलो चरखा। अब चरखा बिना /र/ की आवाज के बोलो चखा

बची हुई परीक्षण मर्दें: इन मर्दों पर कोई भी प्रतिक्रिया ना दें। **अंक (1/0)**

1. बोलो रजाई, अब रजाई बिना /र/ की आवाज के बोलो जाई _____
2. बोलो पगला, अब पगला बिना /प/ की आवाज के बोलो गला _____
3. बोलो मछली, अब मछली बिना /छ/ की आवाज के बोलो मली _____
4. बोलो सूरज, अब सूरज, बिना /ज/ की आवाज के बोलो सूर _____
5. बोलो कबूतर, अब कबूतर बिना /क/ की आवाज के बोलो बूतर _____
6. बोलो अदरक अब अदरक बिना /क/ की आवाज के बोलो अदर _____
7. बोलो सुस्ती। अब सुस्ती बिना /उ/ की आवाज के बोलो। सस्ती _____
8. बाल्टी, अब बाल्टी बिना /ल्/ की आवाज के बोलो बाटी _____
9. बोलो मकड़ी, अब मकड़ी बिना /क/ की आवाज के बोलो मड़ी _____
10. बोलो बोलो प्रकाश, अब प्रकाश बिना /क/ की आवाज के बोलो प्राश _____
11. बोलो चालीस, अब चालीस बिना /च/ की आवाज के बोलो आलीस _____
12. बोलो राष्ट्रीय, अब राष्ट्रीय बिना /य/ की आवाज के बोलो राष्ट्री _____
13. बोलो भारतीय। अब भारतीय बिना /र/ की आवाज के बोलो भातीय _____
14. बोलो कलगी। अब कलगी बिना /ग/ की आवाज के बोलो कली _____
15. बोलो आविष्कार। अब आविष्कार बिना /ष्/ की आवाज के बोलो आविकार _____

Substitution Task in Hindi

प्रतिस्थापन परीक्षण

सामग्री: कुछ नहीं।

प्रतिक्रिया: हर एक अभ्यास मदों पर (सही या गलत) प्रतिक्रिया दें।

फलांकन: हर सही उत्तर के लिये 1 अंक और गलत उत्तर के लिये 0 अंक दे। इस उप-परीक्षण के कुल अंक सही दिये गये उत्तरों का कुल के बराबर होगा।

निर्देश: छात्र से ये कहें, “आओ हम शब्दों का एक खेल खेलें।”

अभ्यास मदें

सही उत्तर

4. बोलो घर। अब घर में /घ/ की आवाज को /ट/ में बदलो। टर
सही उत्तर पर कहें, “बिल्कुल ठीक है। चलो अगला शब्द बोलने का प्रत्यन करें।”
गलत उत्तर पर कहें, “यह सही नहीं है। घर शब्द में /घ/ की आवाज को /ट/ में बदलने पर यह टर बन जाता है।”
5. बोलो कमल। अब कमल में /ल/ की आवाज को /र/ में बदलो। कमर
6. बोलो पतंग। अब पतंग में /त/ की आवाज को /ल/ में बदलो। पलंग

परीक्षण मदें: इन मदों पर कोई भी प्रतिक्रिया ना दें।

अंक (1/0)

- | | | |
|---|-----------|-------|
| 3. बोलो बल। अब बल में /ब/ की आवाज को /क/ में बदलो। | कल | _____ |
| 4. बोलो थाल। अब थाल में /थ/ की आवाज को /च/ में बदलो। | चाल | _____ |
| 5. बोलो सफल। अब सफल में /फ/ की आवाज को /र/ में बदलो। | सरल | _____ |
| 6. बोलो चमन। अब चमन में /च/ की आवाज को /द/ में बदलो। | दमक | _____ |
| 7. बोलो काली। अब काली में /ई/ की आवाज को /ए/ में बदलो। | काले | _____ |
| 8. बोलो सलाई। अब सलाई में /ल/ की आवाज को /फ/ में बदलो। | सफाई | _____ |
| 9. बोलो लुहार। अब लुहार में /उ/ की आवाज को /ओ/ में बदलो। | लोहार | _____ |
| 10. बोलो पोथी। अब पोथी में /ओ/ की आवाज को /आ/ में बदलो। | पाथी | _____ |
| 11. बोलो आँख। अब आँख में /ख/ की आवाज को /च/ में बदलो। | आँच | _____ |
| 12. बोलो मानव। अब मानव में /व/ की आवाज को /स/ में बदलो। | मानस | _____ |
| 13. बोलो प्रतिमा। अब प्रतिमा में /म/ की आवाज को /भ/ में बदलो। | प्रतिभा | _____ |
| 14. बोलो सार। अब सार में /आ/ की आवाज को /ऐ/ में बदलो। | सैर | _____ |
| 15. बोलो काटने। अब काटने में /आ/ की आवाज को /ऊ/ में बदलो। | कूटने | _____ |
| 16. बोलो स्वतन्त्र। अब सलाई में /त/ की आवाज को /य/ में बदलो। | स्वयन्त्र | _____ |
| 17. बोलो अज्ञान। अब अज्ञान में /न/ की आवाज को /त/ में बदलो। | अज्ञात | _____ |

Orthographic Knowledge- Word Marching Task

शब्द मिलान कार्य

समय- 1 मिनट

छात्र का नाम/कोड _____

कक्षा _____

सही उत्तरों की कुल संख्या	
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नीचे दिये गये शब्दों को ध्यान से पढ़ो। जो शब्द एक जैसे हैं उनके नीचे लाइन लगाओ।

उदाहरण-

ताई : ताई

किसान : आसान

1. नल : नल
2. लड़ : पड़
3. गुम : गुम
4. कह : कह
5. जूठ : झूठ
6. ईख : ईख
7. शोर : मोर
8. नाग : नाग
9. आस : आम
10. चाय : गाय
11. हाथी : साथी
12. पानी : पानी
13. तबला : तबले
14. कलम : कलम
15. माली : माला
16. चटपट : चटपट
17. जानां : जाने
18. आदमी : आदमी
19. झंडा : डंडा
20. फौजी : मौजी
21. अस्सी : अस्सी
22. अमर : कमर
23. कौवा : कौवी
24. चालक : चालक
25. घोषित : घोषित

26. तीर्थ : तीर्थ
27. बहादुर : बहादुर
28. खिलौना : खिलौना
29. गौरैया : गौरैया
30. अपेक्षा : सपेक्षा
31. गुब्बारा : गुब्बारे
32. दोपहर : चोपहर
33. राष्ट्रीय : राष्ट्रीय
34. उल्लेख : प्रल्लेख
35. अतिथि : समिति
36. अपनापन : अपनापन
37. प्रचल : प्रबल
38. कापियाँ : टाफियाँ
39. टेलिफोन : टेलिफोन
40. परीश्रम : परीश्रम
41. चुटकुला : चुटकुले
42. हज़ारों : बज़ारों
43. प्रतीक्षा : प्रतीक्षा
44. सामग्री : सामग्री
45. भावनाओं : कामनाओं
46. उदाहरणों : उदाहरणों
47. देशभक्त : देशभक्त
48. अस्पताल : अस्पताल
49. अभिवादन : अभिवक्ता
50. अभिलाषा : अभिलाषा

Non-word Matching Task

गैर-शब्द मिलान कार्य

समय- 1 मिनट

छात्र का नाम/कोड

कक्षा.....

सही उत्तरों की कुल संख्या

नीचे दिये गये गैर-शब्दों के जोड़ों को ध्यान से पढ़ें। जो जोड़े एक जैसे हैं उनके नीचे लाइन लगाओ।

उदाहरण- चाई : चाई

तिसान

:

चिसान

- | | |
|---------------------|---------------------------|
| 1. इग : इग | 26. पागदौड़ : तागदौड़ |
| 2. फाज : पाज | 27. पुलाहा : पुलाहा |
| 3. ऐव : ऐव | 28. कितारे : टितारे |
| 4. वुध : तुध | 29. शिंचाई : शिंचाई |
| 5. तेश : तेश | 30. धिटिया : दिटिया |
| 6. हेल : देल | 31. रालिका : रालिका |
| 7. अक : अक | 32. पहाराज : बहाराजा |
| 8. राच : रार | 33. चलाकार : चलाकार |
| 9. योह : योह | 34. इपाहिज : उपाहिज |
| 10. काप : केप | 35. मेड़िया : मेड़िया |
| 11. मीटे : मीजे | 36. साहगीर : साहगीर |
| 12. कौभा : कौभा | 37. हैलानी : हैलानी |
| 13. जकरी : पकरी | 38. झानकार : घानकार |
| 14. दोपी : दोपी | 39. रगमग : रगमग |
| 15. तुरसी : गुरसी | 40. रुभाती : रौभाती |
| 16. पाफी : पाफी | 41. म्रशंसा : म्रशंसा |
| 17. शात्रा : षात्रा | 42. तहलना : जहलना |
| 18. हिता : हिता | 43. भिमारीयां : भिमारीयां |
| 19. चागल : चानल | 44. किठाईयाँ : तिठाईयाँ |
| 20. काधा : काधा | 45. तहानुभूत : तहानुभूत |
| 21. सादल : मादल | 46. कोशियारी : पोशियारी |
| 22. सिताब : सिताब | 47. ईनाकानी : एनाकानी |
| 23. हनपटी : दनपटी | 48. धादागिरी : धादागिरी |
| 24. भकवास : मकवास | 49. पुनियावी : पुनियावी |
| 25. घनवान : झनवान | 50. सापरवाही : तापरवाही |

Word Chain Task

शब्द श्रृंखला कार्य

समय- 1 मिनट

नाम कोड.....

स्तर.....

सही उत्तरों की कुल संख्या	
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नीचे दी गई प्रत्येक पंक्ति में से शब्द खोजने की कोशिश करें। ध्यान रहे, कि शब्दों के बीच की दूरी को कम कर दिया है लेकिन आपको शब्दों को खोजना है और इनके बीच एक खड़ी रेखा लगा कर इन्हें अलग करना है। रेखा लगाने के बाद आपको शब्द दोबारा लिखने की जरूरत नहीं है।

उदाहरण- तुमरुपयादादीपेड़

तुम/रुपया/दादी/पेड़

1. जगपैरछतरीरेलगाड़ीलड़का
2. घड़ीकहानीटेलिविज़नईनामखरगोश
3. शलगमबहुतसाइकिलपतंग
4. गुणचाँदसूँघनापिकनिकडाल
5. आँगनसभीफूलहैरानी
6. मेहनतप्यारपुस्तकसबड़मारतवरदान
7. कविताहमाराइमलीहारउचितकपड़ा
8. आँगनतीलीषटकोणदोपहरमेज
9. अंडाकठिनवर्षाहकस्वतंत्रत
10. धूर्तझटपटरोगकविताप्ररेणा

Sentence Chain Task

वाक्य श्रृंखला कार्य

समय- 1 मिनट

छात्र का नाम/कोड _____

स्तर _____

सही उत्तरों की कुल संख्या	
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नीचे दी गई प्रत्येक पंक्ति में से शब्द खोजने की कोशिश करें। ध्यान रहे, कि शब्दों के बीच की दूरी को कम कर दिया है लेकिन आपको शब्दों को खोजना है और इनके बीच एक खड़ी रेखा लगा कर इन्हें अलग करना है। रेखा लगाने के बाद आपको शब्द दोबारा लिखने की जरूरत नहीं है।

उदाहरण- यह मेरी कलम है।

यह/मेरी/कलम/है।

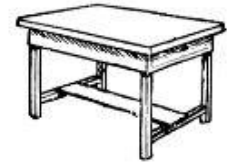
1. बादल गरजरहे थे।
2. तितली फूलों पर मंडराती है।
3. आकाश का रंग नीला है।
4. हमें सदा सच बोलना चाहिए।
5. रात को चाँद सितारे चमकते हैं।
6. गंदगी से कई बिमारियाँ फैलती हैं।
7. रानी ने दस किलो चावल खरीदे।
8. उसने एक सुन्दर घड़ी खरीदी।
9. बंदर ने उसकी टोपी उठाकर पहन ली।
10. खाने की चीजों को ढककर रखो।

RAN Objects

वस्तुओं का तेजी से स्वतः नामकरण

अभ्यास

नीचे दी गई विभिन्न वस्तुओं की तस्वीरों को बाएं से दाएं देखो और उनके नाम बताओ।



अब अगले पेज पर उपर बताई गई वस्तुओं को तुम्हें बाएं से दाएं दोबारा पढ़ना है। जितनी तेजी से तुम बिना रुके पढ़ सकते हो पढ़ो।

